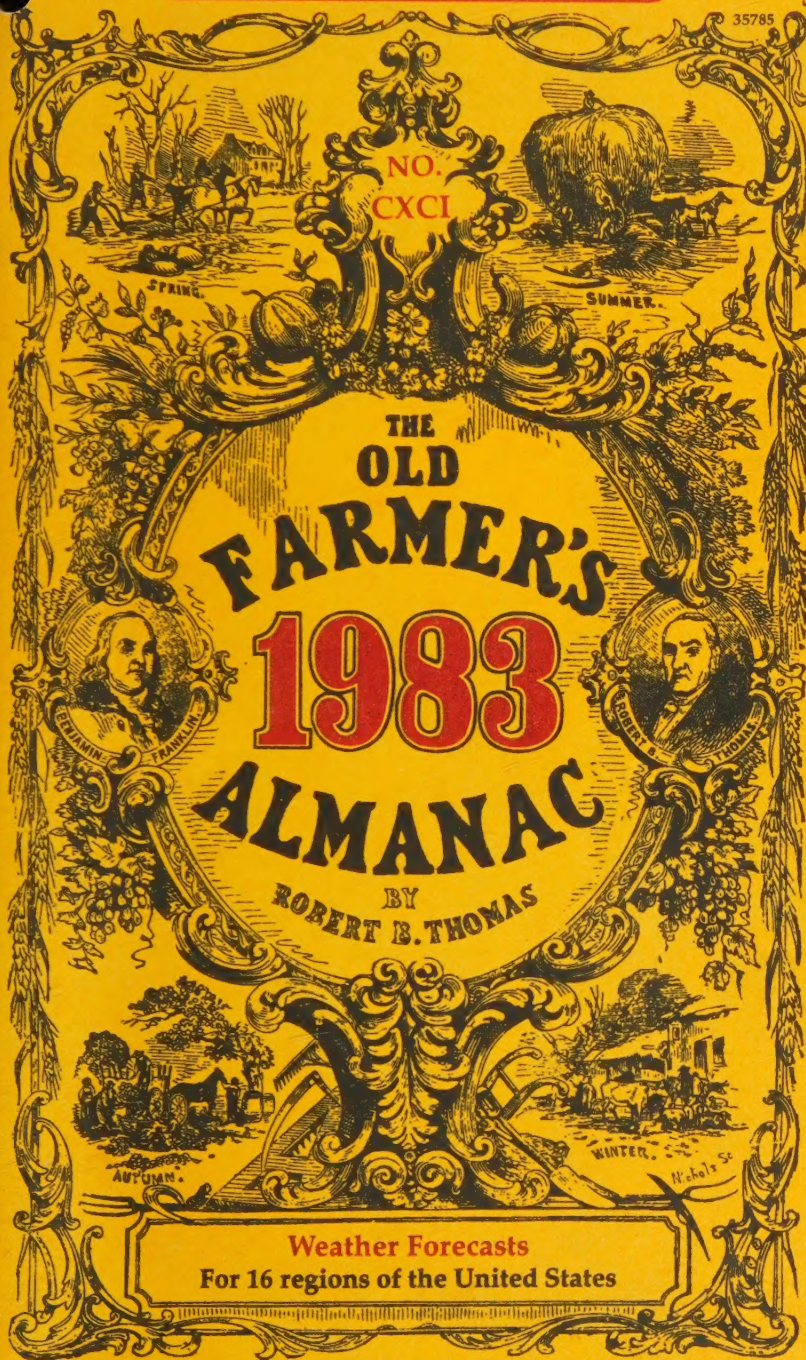


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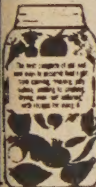
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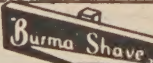
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CARBURETOR GETS 200 MPG!

BY R.C. WEBSTER

WASHINGTON—Establishment of a new world record for fuel economy—an incredible 1,368 miles per gallon achieved in the Shell Motor Mileage Marathon by a special three-wheel vehicle with 90cc engine—has touched off a stampede among car manufacturers and tinkers to drastically increase the gas mileage of cars.

They are attempting to achieve this via the Pogue Carburetor, a device which one of Detroit's "Big Three" auto makers has shown can deliver over 200 mpg to an ordinary sedan. This gas-miserly carburetor has never been mass-produced.

The Pogue is covered by several patents issued by the U.S. Patent Office here, but a recent book asserts that the patents are invalid, that anyone can now build the Pogue without legal restraint. As a result, tinkers and entrepreneurs are racing to mass-produce this peerless fuel conserver.

The book, "Secrets of the 200 MPG Carburetor," contains full details, instructions and diagrams on how to build the Pogue. It states that anyone can build the carburetor, even in a home workshop. Copies of "Secrets of the 200 MPG Carburetor" are available from Premier Distributing, P.O. Box 404-OF, New York, N.Y. 10019, at \$4.95 (plus \$1 postage-handling; total, \$5.95).

The Pogue Carburetor is named for its inventor, Charles Pogue, now 81 and ailing in a Winnipeg, Manitoba, nursing home. Pogue is making no attempt to prevent others from producing and marketing his invention.

205 MPG

One of Detroit's "Big Three," in a test documented in "Secrets of the 200 MPG Carburetor," proved that the Pogue Carburetor does indeed achieve a remarkable 25.7 miles per PINT—or 205 miles per gallon.

Allan Wallace, author of "Secrets of the 200 MPG Carburetor," says the Pogue's gas mileage is not all that remarkable.

He says that others have invented carburetors with exceptionally high gas mileages too, but that the American people have been kept in the dark about them by the oil companies in order to preserve gas sales.

To support his assertion, Wallace documents several instances of stupendous gas mileages, including 84 mpg achieved by Ralph Moody Jr. of Oak Hill, Fla., with a Ford Capri, and 100 mpg by Thomas W. Oglesby of El Paso, Texas, with a Ford Galaxie.

Wallace says he has amassed enough case histories "to fill a set of volumes the size of an entire encyclopedia." He includes construction details for the most interesting and feasible systems in his book.

"I feel the public has a right to know how to produce its own high-mileage systems," he says. "If enough people are tooling around in 100-mpg cars, the auto and oil industries will have no choice but to offer fuel-efficient carburetors in all production models."

80% FUEL WASTE

Wallace says the average car burns only 20 percent of the fuel it consumes. The rest is lost, unburned, and is emitted through the tailpipe to pollute the atmosphere.

All successful high-mileage carburetors drastically increase the percentage of fuel vaporized and burned. "There is no reason why the average car's 20 percent can't be increased to 80 percent," Wallace asserts.

"The carburetor of today is little changed from what it was 50 years ago," he says. "I'm hoping that my book will spur a change—to the benefit of the nation, the ecology, and the consumer."

For a copy, readers of this magazine need merely send their name and address with \$4.95 (plus \$1 postage-handling; total, \$5.95) to Premier Distributing, P.O. Box 404-OF, New York, N.Y. 10019.

This book is sold along with a guarantee of satisfaction or your money back, and is enthusiastically recommended. © PP mcmlxxxiii

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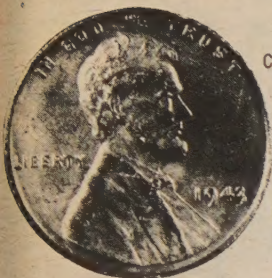
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The things you want most in life needn't be out of your reach, says Marguerite Carter. "Many people are completely unaware that the opportunities for money, love, or advancement are passing them by almost daily. Ever-changing influences touch upon the vital areas of your life all during the year. It is important that you know when and how they work for you or against you."

Get your own Unitology Forecast by this amazing woman. It will be prepared to your specific birthdate information. You get a full year's guidance from one of the world's most highly respected and well-known astrologer-counselors. Test her! See what she has to say about your life in the year ahead. You have a surprise in store!

Ask for Miss Carter's Forecast for your year ahead. It will be compiled to your birthdate information. Print month, day, year, place, hour of birth (if known), and include \$6.95 plus 75¢ for postage and handling. Allow three weeks for receipt.

Address: Marguerite Carter, Box F3, 546 S. Meridian St., Indianapolis, Indiana 46225.

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- It has its revolving tines in the REAR and POWERED WHEELS!
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- It turns your whole garden into one big fabulously fertile "compost pile"!
- It handles so *easily* you guide it with just ONE HAND!
- It leaves NO wheelmarks—and you DON'T have to tramp on the nice, smooth soil you have just tilled or cultivated!



FORGET "Front-End" Tillers like this! →

- They tangle unbearably!
- They shake you half to death!
- They make you tramp on the soil you have just tilled or cultivated! They leave wheelmarks!
- They won't chop *anything* into your garden soil unless it has been "pre-digested" as in a compost pile, or unless it has been pre-chopped as in a separate, expensive chopper-shredder-grinder!
- They'll ruin your garden soil sure—unless you go to all that extra work and expense to put enough organic matter in your soil!
- They take so much of the joy out of gardening it is a downright tragedy they were ever invented!
- SO—FORGET "FRONT-END" TILLERS!
- Get a TROY-BILT and really enjoy that nice garden of yours more than you've ever dreamed possible!



Please mail the coupon for complete details, prices and OFF-SEASON SAVINGS now in effect.

Just **ONE HAND!**

*The wonderfully different
and better idea in TILLERS!*

The TROY-BILT

Roto Tiller-Power Composter
is so easy to handle
your guide it with
Just ONE HAND!



- Has its revolving tines in the **REAR** instead of the **FRONT!**
- Has **POWER DRIVEN WHEELS!**
- You leave **NO** footprints or wheel-marks!
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- The **TROY-BILT®** Roto Tiller is built by the builders of the original famous **ROTOTILLERS**, which introduced rear-end tillage over 50 years ago. This latest and greatest of them all is now, more than ever, the favorite coast to coast with home gardeners, growers, nurserymen, tiller renters, landscape gardeners!
- Several models, including **ELECTRIC STARTING!**
- Does **NOT** tangle near as much as ordinary Tillers because it is actually **TWO** machines in **ONE!** Not only is it a great Tiller, it is also an extremely efficient **COMPOST CHOPPER-SHREDDER!**
- Does **NOT** require great strength... older people, ladies, too, operate it easily. We have many delighted owners in their 70's, 80's, even 90's who tell us they would have given up gardening if they did not have our Tillers!
- Instant depth control! Hood encloses tines for safety and for close cultivating!
- Furrowing, snow removal and other attachments available!

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- Sold direct to keep prices down—would have to be at least \$125 higher if sold ordinary ways!
- Comes with our famous no-time-limit promise to you!
- Will **GREATLY** increase your gardening joy!

For heaven's sake, don't buy any other Tiller—don't put up any longer with the Tiller you now have! Mail the coupon **NOW** for complete details, prices **OFF-SEASON SAVINGS** on this wonderfully different and better idea in Tillers—The **TROY-BILT®** Roto Tiller-Power Composter.

TROY-BILT® Tillers, 102nd St. & 9th Ave., Troy, N.Y.

TROY-BILT® Roto Tiller-Power Composters
GARDEN WAY MFG. CO.
Dept. A1439
102nd St. & 9th Ave., Troy, NY 12180

Please send me the whole wonderful story of your 2-in-1 Roto Tiller-Power Composters with and without electric starting, including prices and "OFF-SEASON" SAVINGS now in effect.

(Please Print Clearly)

Name

Address

City

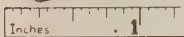
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"Losing Hair? Try This At No Risk."

HOUSTON, Texas — If you don't suffer from male pattern baldness, you can now stop your hair loss . . . and grow more hair.

For years "they said it couldn't be done." But now a firm of laboratory consultants has developed a treatment for both men and women, that is not only stopping hair loss . . . but is really growing hair!

They don't even ask you to take their word for it. They invite you to try the treatment for 32 days, at their risk, and see for yourself!

Naturally, they would not offer this opportunity unless the treatment worked. However, it is impossible to help everyone.

The great majority of cases of excessive hair fall and baldness are the beginning and more fully developed stages of male pattern

baldness and cannot be helped.

But, if you are not already slick bald, how can you be sure what is actually causing your hair loss? Even if baldness may seem to "run in the family," it is certainly not proof of the cause of YOUR hair loss.

Hair loss caused by sebum can also run in your family, and many other conditions can cause hair loss. If you wait until you are slick bald and your hair roots are dead, you are beyond help. So, if you still have any hair on top of your head, and would like to stop your hair loss and grow more hair . . . now is the time to do something about it before it's too late.

Loesch Laboratory Consultants, Inc., will supply you with treatment for 32 days — at their risk — if they believe the treatment will help you. Just send them the information listed below. All inquiries are answered confidentially, by mail. Adv.

NO OBLIGATION COUPON

To: Loesch Laboratory Consultants, Inc.
Dept. F-40, Box 66001, 3311 West Main St.
Houston, Texas 77006

I am submitting the following information with the understanding that it will be kept strictly confidential and that I am under no obligation whatsoever.

Does your forehead become oily or greasy? _____

How soon after washing? _____

Do you have dandruff? _____ Dry or oily? _____

Does your scalp itch? _____ When? _____

How long has your hair been thinning? _____

Does hair pull out easily on top of head? _____

What percentage of hair remains on top of head? _____

Any thin areas? _____ Where? _____

Any slick bald areas? _____ Where? _____

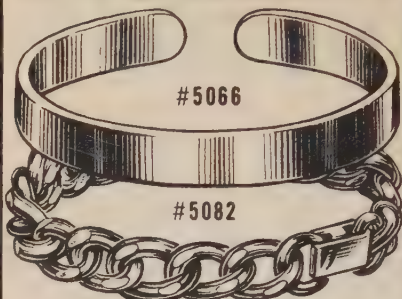
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CITY _____ STATE _____ ZIP _____

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			N.Y.S. Customers MUST add Sales Tax	
			Total Enclosed	

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With a HYDRA-DRILL, you can drill your own water well 50-100-200 feet deep. It's as simple to operate as a power lawn mower. Thousands of HYDRA-DRILL water wells have already been drilled by families who are now enjoying an abundance of pure, fresh **FREE** water.

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Find out how you can cut your water bill 100% and save up to \$1,000 by drilling your own well. Let us send you our HYDRA-DRILL information kit. It's **FREE**—there's no obligation. Don't wait for the next drought or a big increase in your city water bill. Call or write **TODAY!** DeepRock Mfg. Co., Opelika, AL 36802.

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Style C-315



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FREE 10 DAY TRIAL COUPON!

FRANKLIN FASHIONS, Dept. S-866
103 E. Hawthorne Ave., Valley Stream, N.Y. 11580

Rush my "Natural Look Capless Wig" style(s) checked. I must be absolutely satisfied or I can return my order within 10 days and my money will be refunded. Keep the Free Gift in any case.

- ☐ **PREPAID:** I enclose \$8.95 for one wig plus \$1.95 for shipping & handling
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- | | | | | |
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- Check Box of Color Desired (or Send a sample of Your Hair for Expert Matching)
- | | | |
|---------------------------------------|--|---|
| ☐ Black | ☐ Medium Blonde | ☐ Dark Frosted |
| ☐ Off Black | ☐ Ash Blonde | ☐ Mixed Black & Grey |
| ☐ Light Brown | ☐ Platinum | ☐ Mixed Brown & Grey |
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| ☐ Dark Brown | ☐ Dark Auburn | |
| ☐ Light Blonde | ☐ Light Frosted | |

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I want to give you the secret of finding coins that have great value. What's more, America's best coin dealer will buy them from you after you find them. Is it worth a couple of minutes of your time each day looking through your change, so you can make a killing in coins? What if you found a coin that was valuable enough to let you go on a shopping spree and buy a few of the luxuries of life?

Did You Spend This Coin Today?

Take another look at the coin pictured above. It looks almost like an ordinary '72 penny, but there is something almost unnoticeable about it which makes it valuable. You need to read my Coin Guidebook and learn the special markings or dates that make this coin and others valuable.

Otherwise you'll ignore a coin like this and pass it to someone else. Did you spend this coin today? Think about the many valuable

coins that may have slipped through your fingers. Coins don't have to be old to be valuable.

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The new, 1983 Coin Guidebook contains pictures and listings of hundreds of coins that have extra value. It gives the prices I guarantee to pay for them in stable markets.

I've bought hundreds of thousands of dollars of coins from many lucky finders. I'll buy from you, too.

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Hold on to your coins; **DON'T** send them to me until you read the very important safety mailing instructions in the Coin Guidebook. Answers to questions about coins can be found in the Coin Guidebook.

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Total amount enclosed

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**Shrinks Down Your
Waistline As Much As
A FULL SIZE SMALLER
IN JUST 24 HOURS**
(a full inch in a single day)
**4 SIZES SMALLER
IN JUST 14 DAYS!**
**That's right! 4 inches
gone in just 2 weeks.**

**YOU ACTUALLY SHRINK YOUR BODY'S
FAT CELLS STARTING IN JUST HOURS!**

What you see on this page is news of a fantastic crash loss program—the remarkable super slim-down diet from London University—that speeds up your body's rate of fat burn-off so that, IN JUST A MATTER OF HOURS, you start to burn away clinging layers of fat... break down bulging pockets of flab... drain away excess puffy fluid, just like hot water melts down ice... so that, in just the first 48 hours, excess fat, flab, and fluid gets melted away at such a staggering rate of speed you can:

LOSE up to 1 lb. EVERY 8 to 12 HOURS

LOSE up to 1½ to 2 lbs. EACH DAY!

Yes, lose weight by the hour, carve away inches by the week and as stated above, we feel compelled to repeat, shrink down as much as 4 sizes... 4 inches smaller IN JUST 14 DAYS!

**GOVERNMENT OFFICIAL LOSES
10 POUNDS IN JUST 72 HOURS—**

So effectively does this University wonder "crash-loss" diet step up your system's rate of fat burn-off, that:

■ When tested at one of medical science's foremost research centers on scores of grossly overweight men and women... they lost as much as 7 lbs. of excess fat, flab and fluid IN JUST THE FIRST 72 HOURS ALONE, as much as another 3-5—even 7 POUNDS MORE the next 14 days!

■ Even more amazing... when tested not on ordinary overweight people but on the most extreme cases of obesity... it EVAPORATED up to 10 POUNDS OF FAT, FLUID AND FLAB IN JUST 3 DAYS TIME!

**AS MUCH AS 50% OF ALL EXCESS
WEIGHT GONE IN JUST 14 DAYS!**

■ But most mind boggling of all... when tested on average overweight people... who for years lugged around a 'spare tire' bulge of 10, 15 or even 20 extra sagging pounds... IT ACTUALLY MELTED AWAY AS MUCH AS 50% OF ALL EXCESS WEIGHT IN JUST 14 DAYS!

Yes, stepped up their body's rate of fat burn-off and melted away hard set fat with OVER 10 TO 20 TIMES THE SPEED OF EVEN BRUTAL EXERCISE!... like hours of vigorous sit-ups or exhausting calisthenics!



*as much as
4 WAISTLINE
SIZES SMALLER
IN JUST 14 DAYS
That's right! 4
inches gone in
just 2 weeks.*

**URNS YOUR ENTIRE BODY INTO A
SUPER FAT-BURNING FURNACE!**

In fact, based upon Calorie Burn-Off Research from California's Leading Medical School, the calorie-deficit created in your system by this "crash-loss" high-burn program, (a staggering deficit of as much as 2,400 calories a day depending on required daily intake) works with such breathtaking speed you actually:

BURN AWAY FAT!

- Up to 4 TIMES FASTER than running 20 to 25 miles a week
- Up to 4 to 7 TIMES FASTER than over 2 hours of sit-ups or push-ups a week!
- Up to 15 to 22 TIMES FASTER than even a non-stop back-breaking half-hour of brutal weight-lift workout!

**WAKE UP SLIMMER
THE VERY FIRST MORNING!**

What is this amazing fat-destroyer wonder program that helps to burn away fat by the hour—carve away inches by the week?

Briefly stated... it is the London University crash-burn diet, a remarkably simple way to take special combinations of high-burn foods and create what doctors call a "hypo-caloric effect" to take place

AMAZING MEDICAL SCHOOL DEVELOPMENT

(tested by over 500,000 men and women)

**MELTS DOWN FAT LIKE HOT WATER
MELTS DOWN ICE!**

inside their bodies . . . that turns their system into a **GIANT FAT BURNING MACHINE!** Yes, actually reverses your body's fat build-up process as you **COMPLETELY STOP EXCESS** fat-builder calories from entering your system . . . or being absorbed by your body and turned into fat like in the past! So obviously, down go the calories, up goes the rate of fat-burn-off and off come the pounds and inches at a rate that absolutely staggers the imagination!

**AMAZING "INNER-FURNACE EFFECT"
HELPS TRIGGER THE MOST DYNAMITE
FAT-BURN SPREE OF YOUR LIFE!**

Yes, a **TOTAL FAT-DESTROYER** program that **ACTUALLY SHRINKS YOUR BODY'S FAT CELLS** starting in just hours . . . melts down even the most stubborn fatty bulges . . . so you lose weight like never before . . . **LOSE IT BY THE HOUR . . .** all starting the very first day. In fact, of all medically sound reducing programs, only **TOTAL STARVATION WORKS FASTER!**

Because, quite obviously . . . since this University's **ALL OUT ASSAULT ON FAT . . .** raises the level of calorie burn-off . . . "revs-up" that rate of body-fat burn-off . . . pounds and inches vanish at a rate that in plain simple talk is **ABSOLUTELY MIND BLOWING!**

World's Leading Medical Authority on Obesity Reports:

**... as much as 50% of all excess fat
gone in just 14 days.'**

Now comes the most exciting news of all. Because, now, from London, England comes the thrilling announcement and release to the American public of a wondrous reducing-aid formula that works before meals to reduce hunger, to help keep the program's "crash-loss" fat-burning chain-reaction going in your body non-stop all day long.

Called "MIRA-SLIM/100", these doctor tested tablets turn down your hunger drive . . . that maddening urge to eat, just like you dim down a light switch. Makes it easier to lower calorie intake so you safely, surely **TURN UP** the level of your burning metabolism

**IN FACT, OF ALL MEDICALLY
SOUND REDUCING PROGRAMS
ONLY TOTAL STARVATION
WORKS FASTER!**

after every time food enters your body on this London University "crash-burn" diet program.

Meaning the food you take in, the calories you enjoy are burned away by your own stepped-up metabolic system in as little as 2 to 3 hours after eating!

**THE FOOD YOU EAT
NO LONGER TURNS TO FAT!**

So, obviously, since it takes far less food to satisfy you, lowering calories is a lark. And since the calories you do take in on this "crash-loss" diet program are burned right out of your body after every time you eat . . . you start to **TURN SLIMMER**, not only the very first meal . . . **BUT —every meal thereafter!**

**PROVE EVERY LOST OUNCE, EVERY LOST
INCH—ENTIRELY AT OUR RISK**

Right now, look at your figure in the mirror and ask yourself these questions—

How would I look one week from today as much as 5 to 10 pounds lighter?

How would I look in 2 weeks with my waistline 2 to 4 sizes smaller?

BUT DON'T STOP THERE—If you need to lose still more inches, then continue the University "crash-loss" diet, continue to take MIRA-SLIM/100 until you've reached the figure of your dreams:

**6 INCHES CARVED OFF YOUR HIPS . . . UP TO
ANOTHER 3 INCHES CARVED OFF YOUR THIGHS
ANOTHER 4 INCHES OFF YOUR BUTTOCKS . . .
ANOTHER 6 INCHES OFF YOUR STOMACH . . .
ANOTHER 6 INCHES OFF YOUR WAISTLINE!**

Because **NEXT TO STARVATION THERE IS SIMPLY NO OTHER MEDICALLY SOUND REDUCING PROGRAM THAT WORKS FASTER.**

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MAIL NO RISK COUPON

**MIRA-SLIM/100 DIV., Dept. RPWH—11
Station Plaza East, P.O. Box 953, Great Neck, NY 11022**

Yes, I want to lose more weight each day than 15 hours of non-stop exercise. Please **RUSH** me the MIRA-SLIM/100 "Crash-Loss" program as indicated below. I must lose pounds and inches as never before or my money refunded in full (less postage and handling).

CHECK OFFER DESIRED:

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CHARGE IT! (\$10.00 Minimum Charge) ☐ VISA ☐ MasterCard

Credit Card # _____ Exp. Date: _____

Name _____

Address _____

City _____ State _____ Zip _____

Div. London Diet Research, Ltd.

**IF YOU READ NOTHING
ELSE, READ THIS**

This program involves a high-speed crash-loss diet that lowers caloric intake, essential to the reduction of body weight. Such results cannot be achieved solely through the use of the tablets. The more overweight you are, the higher caloric requirements, the more you have to lose the faster you should lose it.

To Patrons

Readers continue to write, "Dear Mr. Thomas . . ." in letters to *The Old Farmer's Almanac*, Dublin, New Hampshire. Understandably. In 191 years, there has never been an edition published under any other name but that of Robert B. Thomas.

Robert B. Thomas started this almanac in 1792 for the year 1793. At that time, George Washington's administration was drawing to a close, the leaders of the Revolution were in the vigor of mature manhood, and the U.S. Constitution had been ratified just four years earlier. Mr. Thomas's first edition sold for sixpence, or about eight cents, and was distributed throughout New England by itinerant book-sellers. In his second edition, Robert B. Thomas quoted a London paper as saying, "Mr. William Hershell is now said, by the aid of powerful glasses, to have reduced to a certainty the opinion that the moon is inhabited."

Fifty editions later, in 1842, Mr. Thomas marveled at the great changes that had taken place in America since his almanac began. "Fifty years ago," he wrote, "the city of New York contained but 33,000 inhabitants; it is now 312,000. Boston had then about 18,000, now 93,000 . . . and fifty years ago we had nothing of the gigantic wonders of steam."

Originally a schoolmaster, farmer, and bookbinder, Robert B. Thomas lived all his life in what's now West Boylston, Massachusetts, although changing town boundaries put his home in Sterling as well as a few other towns over the years. Married but with no children, Mr. Thomas died at age 80 on May 19, 1846, after having produced 54 consecutive annual editions of what was then known as "The Farmer's Almanack." He inserted the word "old" in the title in 1832 to differentiate *his* almanac from the many farmer's almanacs of the time, then dropped it in 1836, but two years after his death his successors established "The OLD Farmer's Almanac" as the permanent and complete title, which it remains to this day. In announcing Robert B. Thomas's death in the 1847 edition, new editor John H. Jenks (the first of 11 editors since Robert B. Thomas) wrote, "We hope . . . to continue the Almanac through the present century at least . . . and the name of Mr. Thomas, who first planned the Almanac . . . will always be connected with its future as in past time."

And so it has. Until 1849, the first or title page was exactly the same as this year's title page, shown opposite — even unto the identical 1809 woodcut of Father Time, rendered by one of America's first woodcut artists, Abel Bowen.

A separate cover depicting some farm animals was wrapped around the almanac for the first time in 1849. Then, three years later, incorporating the faces of the later Robert B. Thomas and Benjamin Franklin, known to be much admired by Mr. Thomas, plus the scenes depicting the four seasons, the now traditional yellow cover and design were established for all time. Except for the date, name, and outside rules, this year's cover art is identical to and was picked up directly from the wood engraving first printed on the cover of the 1852 edition.

So it is that this venerable *Old Farmer's Almanac* serves as an annual link with our American past and, through its astronomical calculations for the forthcoming year, a crystal-clear glimpse into the future. It is now the oldest continuously published periodical on this continent. Robert Bailey Thomas would be proud. (J.H.)

For this 1983 edition, we're particularly indebted to the following: Dr. Richard Head for supplying all the weather data; Susan Mahnke, assisted by Mary Sheldon, Anna Larson, and Polly Bannister, for a huge bulk of the editorial work; John Pierce, Jill Shaffer, and Steve Klett and his staff for production, design, and typesetting, respectively; Marilyn White for ad production; astronomer George Greenstein; astronomical consultant Fred Schaaf; Castle Freeman, Jr. for the Farmer's Calendar essays; Andrew Rohovius, Jody Saville, and Mary Lewis for editorial tasks, and J Porter, Chris Tremblay, and Gordon Heckman for additional design work.

However, it is by our works and not our words that we would be judged. These, we hope, will sustain us in the humble though proud station we have so long held in the name of

Your ob'd. servant,

THE
(OLD)
FARMER'S ALMANACK,

CALCULATED ON A NEW AND IMPROVED PLAN
FOR THE YEAR OF OUR LORD

1983

Being 3rd after BISSEXTILE or LEAP YEAR, and (until July 4)

207th year of American Independence

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RECTIONS AND CALCULATIONS TO ANSWER FOR ALL THE UNITED STATES.

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and the Farmer's Calendar for every month
in the year, a variety of

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ESTABLISHED IN 1792

BY ROBERT B. THOMAS



For all we live to know is known,
And all we seek to keep hath flown.
Let life, then, as the day-flower, fall
With the noon-day beauty — which is all.

Edgar Allan Poe

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Jud Hale

Introduction

Including How to Use This Almanac Anywhere in the U.S.A.

THE LEFT-HAND CALENDAR PAGES

(Pages 46-72)

These pages will provide you with the phases of the moon; the hour and minute of the sun's rising and setting for each day of the year and month; the length of each day; the times of high tides in Boston in the morning and evening ("11¼" under "Full Sea Boston, A.M.," means that the high tide that morning will be at 11:15 A.M. — with the number of feet of high tide shown for some of the dates on the right calendar pages); the hour and minutes of the moon's rising and setting; the declination of the sun in degrees and minutes (angular distance from the celestial equator); the moon's place in the heavens; and finally, in the far right column, the moon's age. The moon's place and age apply, without correction, throughout the United States.

The moon's place given on the left-hand pages is its *astronomical* place in the heavens. (Its astrological place is given on page 89. For more about astrology, see pages 88 and 173-175.) As well as the 12 constellations of the Zodiac, four other abbreviations appear in this column: Ophiuchus (OPH) is a constellation primarily north of the Zodiac, but with a small corner between Scorpio and Sagittarius. Orion (ORI) is a constellation whose northern limit just reaches the Zodiac between Taurus and Gemini. Sextans (SEX) lies south of the Zodiac except for a corner that just touches it near Leo. Cetus (CET) lies south of the Zodiac, just south of Pisces and Aries.

Eastern Standard Time is used throughout this Almanac. (Be sure to add one hour for Daylight Saving Time between April 24 and October 30.) Accompanying much of the data on the left-hand calendar pages are Key letters. These are provided so that the times given can be easily converted to anywhere in the United States — including Alaska and Hawaii. Here's how . . .

Sunrise, Sunset

Note the Key letter to the right of each time for sunset and sunrise, in the column entitled "Key." To find the time of sunset or sunrise for your area, consult the Time Correction Tables (pages 76-80). Find your city or the city nearest you and locate the figure, expressed in minutes, in the appropriate Key letter column. Add, or subtract, that figure to the time given for Boston. The result will be accurate to within 5 minutes for latitudes north of 35°, 10 min. for lat. 30-35°, and 15 min. for lat. 25-30°. *Example:* April 3 (Easter) sunrise at 5:24 A.M., EST, with Key letter B. To find the time of sunrise in Flagstaff, Ariz., look on page 77. Key letter B for Flagstaff is +50 min., so sunrise in Flagstaff is 6:14 A.M., MST. Use the same process for sunset.

Moonrise, Moonset

Moonrise and moonset are figured the same way except that an additional correction factor (see table below) based on longitude should be used. For the longitude of your city, consult pages 76-80.

Longitude of city	58°-76°	77°-89°	90°-102°	103°-115°	116°-127°	128°-141°	142°-155°
Correction minutes	0	+1	+2	+3	+4	+5	+6

Example: To determine moonrise in Amarillo, Texas, for September 19, 1983, see page 66. Moonrise in Boston is 5:08 P.M., with Key letter E. For Amarillo, time correction E (page 76) is +42 min., moving moonrise to 5:50 P.M. The

Longitude of Amarillo is $101^{\circ} 50'$, so the additional correction is +2 minutes. Moonrise in Amarillo is therefore 6:52 P.M., CST. (One hour has been added for Daylight Saving Time.) Follow the same procedure for moonset.

Sundials

Also in the left-hand calendar pages is a column headed "Sun Fast." This is for changing sundial time into local clock time. A sundial reads natural, or sun, time which is neither Standard nor Daylight time except by coincidence. Simply *subtract* Sun Fast time to get local clock time and use Key letter C to correct the time for your city. (Add one hour for Daylight Saving Time April 24-October 30.)

<i>Example:</i>	Boston	Chicago
Sundial reading, Mar. 15	12:00	12:00
Subtract Sun Fast	-6	-6
Add Key C (for Chicago)	-	+5
Clock Time	11:54	11:59

Rising and Setting of the Planets

The times of rising and setting of naked-eye planets, with the exception of Mercury, are given for Boston on pages 34-35. To convert these times to those of other localities (pages 76-80), follow the same procedure as that given for finding the times of sunrise and sunset.

Length of Day

The "Length of Day" column for Boston (pages 46-72) tells how long the sun will be above the horizon. Use the Time Correction Tables (pages 76-80) to determine sunrise and sunset times for your city. Add 12 hours to the time of sunset, subtract the time of sunrise, and you will have the length of day.

Length of Twilight

Subtract from time of sunrise for dawn. Add to time of sunset for dark.

Latitude	25°N to 30°N	31°N to 36°N	37°N to 42°N	43°N to 47°N	48°N to 49°N
	h m	h m	h m	h m	h m
Jan. 1 to Apr. 10	1 20	1 26	1 33	1 42	1 50
Apr. 11 to May 2	1 23	1 28	1 39	1 51	2 04
May 3 to May 14	1 26	1 34	1 47	2 02	2 22
May 15 to May 25	1 29	1 38	1 52	2 13	2 42
May 26 to July 22	1 32	1 43	1 59	2 27	—
July 23 to Aug. 3	1 29	1 38	1 52	2 13	2 42
Aug. 4 to Aug. 14	1 26	1 34	1 47	2 02	2 22
Aug. 15 to Sept. 5	1 23	1 28	1 39	1 51	2 04
Sept. 6 to Dec. 31	1 20	1 26	1 33	1 42	1 50

Dawn and Dark

The approximate times dawn will break and dark descend are found by applying the length of twilight taken from the table above to the times of sunrise and sunset at any specific place. The latitude of the place (see pages 76-80) determines the column from which the length of twilight is to be selected.

Boston (latitude $42^{\circ} 22'$)

Sunrise Apr. 3	5:24 A.M.
Length of twilight	-1:33
Dawn breaks	3:51 A.M.
Sunset	6:12 P.M.
Length of twilight	+1:33
Dark descends	7:45 P.M.

Miami (latitude $25^{\circ} 47'$)

Sunrise Apr. 3	6:16 A.M.
Length of twilight	-1:20
Dawn breaks	4:56 A.M.
Sunset	6:49 P.M.
Length of twilight	+1:20
Dark descends	8:09 P.M.

THE RIGHT-HAND CALENDAR PAGES

(Pages 47-73)

These pages are a combination of astronomical data; specific dates in mainly the Anglican church calendar, inclusion of which has always been traditional in American and English almanacs (though we also include some other religious dates); tide heights at Boston (the left-hand calendar pages include the daily times of high tides; the corrections for your locality are on pages 74-75); quotations; anniversary dates; appropriate seasonal activities; and a rhyming version of the weather forecasts for the Northeast. (Detailed forecasts for the entire country are presented on pages 98-128.)

The following is a short summary of the highlights from this year's right-hand calendar pages, the signs used, and a sample (the first part of November 1982) of a calendar page explained. . . .

Movable Feasts and Fasts for 1983

Epiphany	Jan. 6	Low Sunday	Apr. 10
Septuagesima Sunday	Jan. 30	Rogation Sunday	May 8
Shrove Tuesday	Feb. 15	Ascension Day	May 12
Ash Wednesday	Feb. 16	Whit Sunday-Pentecost	May 22
Palm Sunday	Mar. 27	Trinity Sunday	May 29
Good Friday	Apr. 1	Corpus Christi	June 2
Easter Day	Apr. 3	1st Sunday in Advent	Nov. 27

The Seasons of 1983

Winter (1982)	Dec. 21	11:39 P.M. E.S.T.	(Sun enters Capricorn)
Spring	Mar. 20	11:39 P.M. E.S.T.	(Sun enters Aries)
Summer	June 21	6:09 P.M. E.S.T.	(Sun enters Cancer)
Fall	Sept. 23	9:42 A.M. E.S.T.	(Sun enters Libra)
Winter (1983)	Dec. 22	5:30 A.M. E.S.T.	(Sun enters Capricorn)

Chronological Cycles for 1983

Golden Number (Lunar Cycle) . . .	8	Roman (A.U.C.)	2736	Jan. 14
Epact	16	Nabonassar	2732	Apr. 28
Solar Cycle	4	Japanese	2643	Jan. 1
Dominical Letter	B	Grecian	2295	Sept. 14
Roman Indiction	6	(Seleucidæ)		(or Oct. 14)
Year of Julian Period	6696	Indian (Saka)	1905	Mar. 22
ERA Year Begins		Diocletian	1700	Sept. 12
Byzantine 7492	Sept. 14	Islamic (Hegira)	1404	Oct. 8
Jewish (A.M.) 5744	Sept. 8	Chinese (Lunar)	Pig	Feb. 13

Determination of Earthquakes

Note, on right-hand pages 47-73, the dates when the moon (☾) "runs high" or "runs low." The date of the high begins the most likely five-day period of earthquakes in the northern hemisphere; the date of the low indicates a similar five-day period in the southern hemisphere. You will also find on these pages a notation for moon on the Equator (☾ on Eq.), twice each month. At this time, in both hemispheres, is a two-day earthquake period.

Names and Characters of the Principal Planets and Aspects

Every now and again on these right-hand calendar pages, you will see symbols conjoined in groups to give you what is happening in the heavens. For example $\odot \text{h} \text{C}$ opposite February 3 on page 53 means that Saturn h and the Moon C are on that date in conjunction $\odot$ or apparently near each other.

Here are the symbols used . . .

- | | | | |
|---|---------------------|-----------------------------|---------------------|
| $\odot$ The Sun. | ♀ Venus. | ♃ Jupiter. | ♆ Neptune. |
| $\bigcirc \bullet \text{C}$ The Moon. | $\oplus$ The Earth. | ♄ Saturn. | ♇ Pluto. |
| ☿ Mercury. | ♂ Mars. | ♅ Uranus. | |
| $\odot$ Conjunction, or in the same degree. | | ♊ Ascending Node. | |
| ♋ Opposition, or 180 degrees. | | ♋ Descending Node. | |

Sample Page (from November 1982-page 47)

Day of the month.

Day of the week.

For detailed regional forecasts, see pages 98-128.

Conjunction — closest apparent approach — of Mercury and Saturn.

The moon is at perigee, or its closest approach to the earth.

The moon is at the ascending node, crossing from below to above the ecliptic plane (the plane in which the earth travels in its yearly motion around the sun).

The Dominical Letter for 1982 is C, because the first Sunday of the year fell on the third day of January. The letter for 1983 is B.

23rd Sunday after Pentecost. Events in the church calendar generally appear in this typeface.

Named for St. Martin of Tours, the "Soldier Saint," who died November 11, A.D. 397; this popular festival is also called Martinmas. Certain religious feasts and civil holidays appear in this typeface.

The moon is located on the celestial equator.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	M.	All Saints • $\odot \text{♀} \text{h}$ • Full Beaver $\bigcirc$ • {10.9 10.3	Mop
2	Tu.	All Souls • Election Day • Tides {11.2 10.3	up
3	W.	♀ sup. $\odot$ • A curdly sky at • Will not leave the earth long dry. • those	
4	Th.	at • Great Vt. flood {10.2 peri. killed 24, 1927 • {11.4 • raindrops.	
5	Fr.	Guy Fawkes' Plot • at $\odot$ • Tides {9.9 11.1	Climb
6	Sa.	is never forgot. runs • 98 m.p.h. winds, Block • {9.6 high • Island, R.I., 1953 • {10.8	a peak
7	C	23 rd S. af. P. • F.D.R. won fourth term, 1944 • this	
8	M.	Thunder in November means • Tides {9.1 a fertile year to come. • {10.0	cool
9	Tu.	Margaret Sanger formed American • {9.1 Birth Control League, 1921 • {9.7	week.
10	W.	Silence is not always a sign of wisdom, • No hoax, But babbling is ever a folly. • {9.6	wear
11	Th.	St. Martin • Veterans Day • Tides {9.6 on • Elizabeth Cady • {9.9	
12	Fr.	Eq • Stanton b. 1815 • {9.7 • rain cloaks.	
13	Sa.	Sadie Hawkins • $\odot \text{♃} \text{C}$ • $\odot \text{h} \text{C}$ • Sleet	

Morning tide, shown to be at 4:30 A.M. on the left-hand page, will be 9.1 feet. Evening tide, at 4:45 P.M., will be 10.0 feet.

NOTE: The values of Key Letters are given in the Time Correction Tables. (See pages 76-80.)

How the Almanac Weather Forecasts Are Made

Our weather forecasts are determined both by the use of a secret weather forecasting formula devised by the founder of this almanac in 1792 and by the most modern scientific calculations based on solar activity. We believe nothing in the universe occurs haphazardly; that there is a cause-and-effect pattern to all phenomena, including weather. It follows, therefore, that we believe weather is predictable. It is obvious, however, that neither we nor anyone else has as yet gained sufficient insight into the mysteries of the universe to predict weather with anything resembling total accuracy.

Earth at Aphelion and Perihelion 1983

The Earth will be at Perihelion on January 2, 1983, when it will be 91,400,005 miles from the Sun. The Earth will be at Aphelion on July 6, 1983, when it will be 94,512,258 miles from the Sun.

Holidays, 1983

(*) Are recommended as holidays with pay for all employees. (**) State holidays only.

- | | |
|--|---|
| Jan. 1 (*) New Year's Day | June 11 (**) King Kamehameha I Day (Ha.) |
| Jan. 8 (**) Battle of New Orleans (La.) | June 14 (**) Flag Day (Pa.) |
| Jan. 15 (**) Martin Luther King's Birthday
(Conn., D.C., Fla., Ga., Ill., La., Md.,
Mass., Mich., N.J., Oh., Pa., S.C.) | June 17 (**) Bunker Hill Day (Boston and
Suffolk Co., Mass.) |
| Jan. 19 (**) Robert E. Lee's Birthday (Ala.,
Ark., Fla., Ga., La., Miss., N.C., S.C.);
Lee-Jackson Day (Va.); Confederate
Heroes Day (Tex.) | June 19 (**) Juneteenth (Tex.) |
| Jan. 26 (**) General Douglas MacArthur
Day (Ark.) | June 19 Father's Day |
| Feb. 2 Groundhog Day | July 1 Dominion Day (Canada) |
| Feb. 12 (**) Abraham Lincoln's Birthday | July 4 (*) Independence Day |
| Feb. 14 Valentine's Day | Aug. 1 (**) Colorado Day |
| Feb. 16 Ash Wednesday | Aug. 8 (**) Victory Day (Ariz. and R.I.) |
| Feb. 21 (*) George Washington's Birthday
(Presidents' Day) | Aug. 16 (**) Bennington Battle Day (Vt.) |
| Mar. 2 (*) Texas Independence Day | Aug. 27 (**) Lyndon Johnson's Birthday
(Tex.) |
| Mar. 17 Evacuation Day (Boston); St. Pat-
rick's Day | Sept. 5 (*) Labor Day |
| Mar. 29 Passover | Sept. 8 Rosh Hashanah |
| Apr. 3 Easter | Sept. 9 (**) Admission Day (Cal.) |
| Apr. 13 Thomas Jefferson's Birthday (Ala.) | Sept. 17 Citizenship Day |
| Apr. 18 (**) Patriots Day (Me., Mass.) | Sept. 17 Yom Kippur |
| Apr. 22 (**) Arbor Day (Neb.) | Sept. 23 American Indian Day |
| Apr. 25 (**) Fast Day (N.H.) | Oct. 3 Child Health Day |
| Apr. 25 (**) Confederate Memorial Day
(Fla., Ga., Miss.) | Oct. 10 (*) Columbus Day |
| Apr. 29 Arbor Day (except Alas. and Neb.) | Oct. 24 United Nations Day |
| May 1 May Day | Oct. 31 Halloween |
| May 8 Mother's Day | Nov. 1 (**) All Saints Day (La.) |
| May 21 Armed Forces Day | Nov. 4 (**) Will Rogers Day (Okla.) |
| May 24 Victoria Day (Canada) | Nov. 8 General Election Day |
| May 30 (*) Memorial Day | Nov. 11 (*) Veterans Day (Armistice Day) |
| June 3 Jefferson Davis's Birthday | Nov. 12 Sadie Hawkins Day |
| | Nov. 24 (*) Thanksgiving Day |
| | Dec. 1 Hannukah |
| | Dec. 15 Bill of Rights Day |
| | Dec. 17 Wright Brothers Day |
| | Dec. 21 Forefathers Day (New England) |
| | Dec. 25 (*) Christmas Day |

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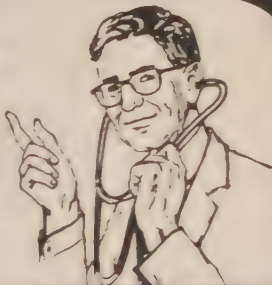
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GLOSSARY

- Aph.** — **Aphelion:** Planet reaches point in its orbit farthest away from Sun.
- Apo.** — **Apogee:** Moon reaches point in its orbit farthest from Earth.
- Conj.** — **Conjunction:** Time of apparent closest approach to each other of any two heavenly bodies.
- Declination:** Measure of angular distance any celestial object lies perpendicularly north or south of celestial equator; analogous to terrestrial latitude. OFA gives declination at noon E.S.T.
- Dominical Letter:** Used for the ecclesiastical calendar and determined by the date on which the first Sunday of the year falls. If Jan. 1 is a Sunday, the Letter is A; if Jan. 2 is a Sunday, the Letter is B; and so to G when the first Sunday is Jan. 7. In leap years the Letter applies through February and then takes the Letter before.
- Eclipse, Annular:** An eclipse in which sunlight shows around the Moon.
- Eclipse, Lunar:** Opposition of Sun and Moon with Moon at or near node.
- Eclipse, Solar:** Conjunction of Sun and Moon with Moon at or near node.
- El.** — **Elongation:** Apparent angular distance of a member of the solar system from the Sun as seen from the Earth.
- Epact:** A number from 1 to 30 to harmonize the lunar year with the solar year, used for the ecclesiastical calendar. Indicates the moon's age on Jan. 1.
- Eq.** — **Equator:** A great circle of the Earth equidistant from the two poles.
- Equinox, Fall:** Sun passes from northern to southern hemisphere.
- Equinox, Spring:** Sun passes from southern to northern hemisphere.
- Gr. El.:** Greatest Elongation.
- Golden Number:** Denoting the year in the 19-year cycle of the Moon. The moon phases occur on the same dates every 19 years.
- Inf.** — **Inferior:** Conjunction in which the Planet is between the Sun and the Earth.
- Julian Period:** A period of 7,980 Julian years, being a period of agreement of solar and lunar cycles. Add 4713 to year to find Julian year.
- Moon's Age:** The number of days since the previous new moon. First Quarter: Right half of moon illuminated. Full Moon: Moon reaches opposition. Last Quarter: Left half of moon illuminated. New Moon: Sun and Moon in conjunction.
- Moon Runs High or Low:** Day of month moon is highest or lowest exactly above the South point of observer's horizon.
- Node:** Either of the two points where the moon's orbit intersects the ecliptic.
- Occultations:** Eclipses of stars by the Moon.
- Opposition:** Time when Sun and Moon or planet appear on opposite sides of the sky (El. 180 degrees).
- Perig.** — **Perigee:** Moon reaches point in its orbit closest to Earth.
- Perih.** — **Perihelion:** Planet reaches point in its orbit closest to Sun.
- R.A.** — **Right Ascension:** The coordinate on the celestial sphere analogous to longitude on the earth.
- Roman Indiction:** A cycle of 15 years established Jan. 1, A.D. 313 as a fiscal term. Add 3 to the number of years in the Christian era and divide by 15. The remainder is the year of Roman Indiction — no remainder is 15.
- Solar Cycle:** A period of 28 years, at the end of which the days of the month return to the same days of the week.
- Solstice, Summer:** Point at which the Sun is farthest north of the celestial equator; Sun enters Cancer. **Winter:** Point at which the Sun is farthest south of the celestial equator; Sun enters Capricorn.
- Stat.** — **Stationary:** Halt in apparent movement of a planet against the background of the stars just before the planet comes to opposition.
- Sunrise & Sunset:** Visible rising and setting of Sun's upper limb across the unobstructed horizon of an observer whose eyes are 15' above ground level.
- Sun Fast:** Subtract times given in this column from your sundial to arrive at the correct Standard Time.
- Sup.** — **Superior:** Superior Conjunction; indicates that the Sun is between the planet and the Earth.
- Twilight:** Begins or ends when stars of the sixth magnitude disappear or appear at the zenith; or when the Sun is about 18 degrees below the horizon.

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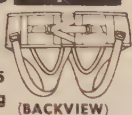
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The Planets, 1983

Below are given the times of rising or setting of the planets Venus, Mars, Jupiter, and Saturn on the 1st, 11th, and 21st of each month. The time of rising or setting of any one of these planets on other days may be found with sufficient accuracy by interpolation. For an explanation of Key Letters (used in adjusting the times given here for Boston to the time in your town), see page 26 and pages 76-80. Key Letters appear below as capital letters following the time of rising or setting.

VENUS is brilliant in the evening sky from the beginning of the year until just after mid-August, when it becomes too close to the sun for observation. At the end of August it reappears as a morning star and can be seen in the morning sky through December. Venus is in conjunction with Mercury January 7 and August 6; with Mars February 18, September 14, and October 28; with Saturn December 17.



Boldface — P.M. Lightface — A.M.

Jan. 1 set 5:25 A	May 1 set 10:15 E	Sept. 1 rise 4:30 B
Jan. 11 " 5:50 A	May 11 " 10:29 E	Sept. 11 " 3:31 B
Jan. 21 " 6:16 B	May 21 " 10:35 E	Sept. 21 " 2:49 B
Feb. 1 set 6:44 B	June 1 set 10:34 E	Oct. 1 rise 2:24 B
Feb. 11 " 7:09 B	June 11 " 10:25 E	Oct. 11 " 2:13 B
Feb. 21 " 7:34 C	June 21 " 10:10 D	Oct. 21 " 2:12 B
Mar. 1 set 7:54 C	July 1 set 9:49 D	Nov. 1 rise 2:18 B
Mar. 11 " 8:18 D	July 11 " 9:21 D	Nov. 11 " 2:29 C
Mar. 21 " 8:43 D	July 21 " 8:47 D	Nov. 21 " 2:44 C
Apr. 1 set 9:10 D	Aug. 1 set 7:59 C	Dec. 1 rise 3:01 D
Apr. 11 " 9:34 E	Aug. 11 " 7:07 C	Dec. 11 " 3:20 D
Apr. 21 " 9:57 E	Aug. 21 rise 5:45 B	Dec. 21 " 3:40 D
		Dec. 31 rise 4:02 D

MARS is visible as a reddish object in Capricorn in the evening sky early in the year; it gradually decreases its eastern elongation until early April, when it becomes too close to the sun for observation. It reappears in the morning sky towards the end of July, where it remains for the rest of the year, passing 4° N. of Spica on December 27. Mars is in conjunction with Venus February 18, September 14, and October 28; with Mercury April 9.



Jan. 1 set 7:22 B	May 1 set 7:25 D	Sept. 1 rise 2:50 A
Jan. 11 " 7:24 B	May 11 " 7:23 E	Sept. 11 " 2:43 A
Jan. 21 " 7:26 B	May 21 " 7:20 E	Sept. 21 " 2:37 B
Feb. 1 set 7:27 B	June 1 set 7:16 E	Oct. 1 rise 2:30 B
Feb. 11 " 7:28 B	June 11 rise 3:58 A	Oct. 11 " 2:23 B
Feb. 21 " 7:29 C	June 21 " 3:45 A	Oct. 21 " 2:15 B
Mar. 1 set 7:29 C	July 1 rise 3:35 A	Nov. 1 rise 2:06 B
Mar. 11 " 7:29 C	July 11 " 3:25 A	Nov. 11 " 1:57 B
Mar. 21 " 7:29 D	July 21 " 3:17 A	Nov. 21 " 1:48 C
Apr. 1 set 7:28 D	Aug. 1 rise 3:09 A	Dec. 1 rise 1:38 C
Apr. 11 " 7:27 D	Aug. 11 " 3:03 A	Dec. 11 " 1:28 C
Apr. 21 " 7:26 D	Aug. 21 " 2:57 A	Dec. 21 " 1:17 C
		Dec. 31 rise 1:06 D

JUPITER rises well before sunrise at the beginning of the year and is at opposition on May 27, when it can be seen throughout the night. From late August until early December it is visible only in the evening sky and then becomes too close to the sun for observation. At the end of the year it is visible in the morning sky. Jupiter is in conjunction with Mercury November 26.

JUPITER



Jan. 1	rise	4:12	E	May 1	rise	8:54	E	Sept. 1	set	9:50	A		
Jan. 11	"	3:42	E	May 11	"	8:10	E	Sept. 11	"	9:14	A		
Jan. 21	"	3:11	E	May 21	"	7:25	E	Sept. 21	"	8:40	A		
Feb. 1	rise	2:36	E	June 1	set	4:06	A	Oct. 1	set	8:05	A		
Feb. 11	"	2:04	E	June 11	"	3:23	A	Oct. 11	"	7:32	A		
Feb. 21	"	1:30	E	June 21	"	2:39	A	Oct. 21	"	6:59	A		
Mar. 1	rise	1:02	E	July 1	set	1:57	A	Nov. 1	set	6:24	A		
Mar. 11	"	12:26	E	July 11	"	1:15	A	Nov. 11	"	5:52	A		
Mar. 21	rise	11:44	E	July 21	"	12:34	A	Nov. 21	"	5:21	A		
Apr. 1	rise	11:01	E	Aug. 1	set	11:47	A	Dec. 1	set	4:50	A		
Apr. 11	"	10:20	E	Aug. 11	"	11:08	A	Dec. 11	"	4:20	A		
Apr. 21	"	9:38	E	Aug. 21	"	10:31	A	Dec. 21	rise	6:45	E		
											Dec. 31	rise 6:16	E



SATURN rises well after midnight at the beginning of the year and remains in the constellation Virgo until late October, when it moves into Libra for the remainder of the year. Saturn is at opposition on April 21, when it can be seen all night. It is visible only in the evening sky from late July until mid-October, then becomes too close to the sun for observation until mid-November, after which it is visible in the morning sky for the rest of the year. Saturn is in conjunction with Venus December 17.

Jan. 1	rise	1:43	D	May 1	set	4:36	B	Sept. 1	set	8:27	B
Jan. 11	"	1:07	D	May 11	"	3:55	B	Sept. 11	"	7:50	B
Jan. 21	"	12:30	D	May 21	"	3:14	B	Sept. 21	"	7:13	B
Feb. 1	rise	11:45	D	June 1	set	2:29	B	Oct. 1	set	6:36	B
Feb. 11	"	11:06	D	June 11	"	1:48	B	Oct. 11	"	6:00	B
Feb. 21	"	10:26	D	June 21	"	1:08	B	Oct. 21	"	5:23	B
Mar. 1	rise	9:53	D	July 1	set	12:28	B	Nov. 1	set	4:44	B
Mar. 11	"	9:12	D	July 11	set	11:45	A	Nov. 11	rise	5:34	D
Mar. 21	"	8:30	D	July 21	"	11:06	B	Nov. 21	"	5:01	D
Apr. 1	rise	7:43	D	Aug. 1	set	10:24	B	Dec. 1	rise	4:27	D
Apr. 11	"	7:00	D	Aug. 11	"	9:46	B	Dec. 11	"	3:53	D
Apr. 21	"	6:17	D	Aug. 21	"	9:08	B	Dec. 21	"	3:19	D
								Dec. 31	rise	2:44	D

MERCURY can only be seen low in the east before sunrise, or low in the west after sunset (near the beginning or end of civil twilight). It is visible mornings between these approximate dates: January 22-March 16, May 21-July 2, September 23-October 17. It is brighter at the end of each period; the first week of October is the best time to view it in northern latitudes. It is visible evenings between these approximate dates: January 1-January 10, April 4-May 4, July 18-September 9, November 16-December 26. The planet is brighter at the beginning of each period; mid-April is the best time to view it in northern latitudes.

(A Planet is called Morning Star when it is above the horizon at sunrise, and Evening Star when it is above the horizon at sunset. Precisely, it is a Morning Star when it is less than 180° west of the Sun in right ascension, and Evening Star when it is less than 180° east. When a planet is near conjunction or opposition, the distinction is unimportant.)

Letters to the Astronomer

Dr. George Greenstein, astronomer
for *The Old Farmer's Almanac*, answers questions

Can you see the new moon?

No. The new moon lies next to the sun, too close to it to be seen. The moon is lost in the glare.



Are the dark spaces apparent in the nighttime sky the absence of stars, or is something blocking them out?

Something is blocking the stars. These dark regions are best seen along the Milky Way and give it a clumpy, mottled appearance. Actually the Milky Way is quite smooth: what we see are huge dark clouds of interstellar gas and dust silhouetted against it. The center of our galaxy, an enormous spherical swarm of stars, lies along the Milky Way, and it would make a spectacular sight in the summer sky if it were not obscured in this way.



Why are there seasons for meteor showers, and why are they visible only at certain times of night?

At any given date in the year the Earth is at a certain point in its orbit: next year at the same date it will be at exactly the same place. At some of these places are found huge swarms of tiny pebbles — called meteoroids — and when the Earth runs through these swarms they burn up in the atmosphere and we see them as meteors, or fiery streaks. Actually meteors occur at any time of night (or day for that matter), but they are best observed after midnight when we are standing on the forward side of the Earth, which is the side into which the meteor showers directly plow.

Why is there a three-hour time difference from the East to the West Coast rather than two or four?

Fly all the way around the Earth and you will have “slipped” one full day — this is why we have the International Date Line. The distance from coast to coast is roughly $\frac{3}{24}$ of the way around the world: thus you “slip” $\frac{3}{24}$ of a day, or three hours, in such a journey.



Why aren't there exactly 12 hours of daylight and 12 of night at the fall and spring equinoxes?

On the equinoxes the very center of the sun sets just 12 hours after it rose. But day *begins* when the upper edge of the sun reaches the horizon — which happens a bit before the center rises — and it does not end until the other edge has set, shortly after the center. Not only that, but the sun is actually visible when it is below the horizon: our atmosphere refracts its rays, and bends them in an arc over the horizon.



What does the term “background radiation” mean?

It is the faint residual glow left over from the Big Bang in which astronomers believe the universe began. At the moment of the Bang everything was exceedingly hot and blazed with a brilliant light. This light is still present, although diluted and cooled by the expansion of the universe throughout the 20 billion years that have passed. It is now detected as a faint hiss in our radio telescopes, filling all space and coming from every direction at once. □ □



Cucumber and Beauty

by ANA MAHER

Every woman, at some time in her life, faces the spectre of an aging skin. Most women never solve the problem, and finally become resigned. A fortunate few find the answer and are rewarded with a complexion that remains fresh and youthful all their lives.

I had this skin problem 17 years ago. Nothing very serious, but when I took my mirror over to a bright light, I could detect evidence of dryness and tell-tale signs of advancing years. And I didn't like it. I knew that these were danger signals that warned of an aging skin.

I was also very bewildered. I had always taken the best care of my skin. And no matter what I did, my complexion showed no improvement. Finally I became resigned. After all, everybody gets older and most of us show our age.

Then one day I had a visit from an elderly widowed neighbor. This charming lady was about seventy, but she had the most beautiful, moist, youthful skin. I remarked about it and mentioned my own skin problem.

She told me she used a marvelous cream which had been formulated by her late husband, a physician, and that she made it herself. "Try it," she said, and then she left and returned with a jar of this cream.

So I tried using my neighbor's cream.

In only three weeks, I began to see a marked improvement. My skin was fresher, clearer, smoother. After two months, my former dry, dull skin was revitalized. My skin now had a youthful, almost translucent quality. I was thrilled with my neighbor's formula.

For six years, this kind lady kept me supplied with this cream. And I want to tell you that my skin was more vital and younger looking than it had been when I first started to use it, six years before.

Then my neighbor died suddenly — and with her went that wonderful cream and its secret ingredients. I was saddened by the loss of a good friend — and dejected by the loss of a miracle cream. Her family told me that her personal papers revealed no formulas of any kind. I was desperate. But I did have three jars left from the last batch she had made.

So I took the cream to one of the best known analytical cosmetic chemists. The cost of the analysis was enormous, but I got what I wanted. I had the wonder cream formula.

It had a base of pure cucumber juice, two super-moisturizers, three natural lubricants, and a special component to keep the cucumber juice fresh. My chemist told me that the formula consisted of only safe, pure ingredients — no hormones, estrogens or steroids.

I made a batch of cream for myself, following the chemist's instructions. Then my friends and relatives began using it. And in every case, the results were absolutely astounding.

Soon friends began insisting that the cream should be made known and available to all women, since the problem of aging skin is universal.

So my cream was put on the market 11 years ago, with the financial help of an uncle. It is called Cucumbre Frost.

The same wonderful results experienced by me, my friends and relatives were repeated time and time again by women all over the country. I have in my file hundreds of letters from grateful women telling of the remarkable results obtained with Cucumbre Frost.

Treatment is not a complicated ritual. I don't have time for that and the chances are you don't, either. You apply Cucumbre Frost at bedtime. Leave it on all night. It feeds, protects and nourishes your skin while you sleep.

I know what Cucumbre Frost can do for you. Therefore, I offer you this UNCONDITIONAL GUARANTEE. Try it. See for yourself in your own mirror how, after a few treatments, Cucumbre Frost helps revitalize dull, dry, aging skin. How, when used regularly, Cucumbre Frost helps facial skin to regain lost smoothness, moistness and freshness. Many women wrote me of astonishing results after only two weeks. Some take longer. But I say this to you: if, for any reason you are not delighted with Cucumbre Frost — return the unused portion to me for a complete refund. No questions asked.

You now have the opportunity to have a vital, youthful, lovely skin — at no risk. Cucumbre Frost can be purchased only by ordering it directly from me. Simply send your name, address and \$7.00 (cash, check or money order) to:

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ECLIPSES FOR 1983

There will be four eclipses in 1983, two of the sun and two of the moon. Solar eclipses are visible only in certain local areas on earth; lunar eclipses are visible from the entire night side of the earth.

1. Total eclipse of the sun, June 11. (The sun is completely obscured by the moon.) This eclipse will not be visible in North America. It can be seen in Madagascar, extreme Southeast Asia, Indonesia, Australia, and west of New Zealand.

2. Partial eclipse of the moon, June 25. (Part of the moon passes through the umbra, or darkest portion of the earth's shadow.) This eclipse will be visible in the Americas and Australia.

3. Annular eclipse of the sun, December 4. (The moon is seen silhouetted against the sun, and is surrounded by a ring of sunlight.) The eclipse can be seen from the extreme northeastern United States and the Maritime Provinces of Canada. It begins at 4:41 A.M. EST and ends at 11:19 A.M.; the prime viewing area is over Africa and southern Europe.

4. Penumbral eclipse of the moon, December 19. (The moon passes only through the penumbra, or partially illuminated outer portion of the earth's shadow.) This eclipse will be visible from most of the United States and Canada. It begins at 6:45 P.M. EST and ends at 10:52 P.M.

FULL MOON DAYS

	1983	1984	1985	1986	1987		1983	1984	1985	1986	1987
Jan.	28	17	7	25	14	July	24	13	2/31	21	10
Feb.	27	15	5	24	13	Aug.	23	12	30	19	9
Mar.	28	17	7	25	15	Sept.	22	10	29	18	7
Apr.	27	15	5	24	13	Oct.	21	10	28	17	6
May	26	15	4	23	13	Nov.	20	8	27	16	5
June	25	13	3	21	11	Dec.	19	8	27	16	5

PRINCIPAL METEOR SHOWERS

(from the *Handbook of the British Astronomical Association*)

Shower	Date of Maximum	Approximate Peak Rate (/hr.)	Associated Comet
Quadrantid	Jan. 4	100	—
Lyrid	Apr. 21	15	1861 I
Eta Aquarid	May 4	18	Halley
Delta Aquarid	July 30	38	—
Perseid	Aug. 11-13	65	1862 III
Draconid	Oct. 9	10	Giacobini-Zinner
Orionid	Oct. 20	38	Halley
Taurid	Nov. 9	16	Enke
Andromedid	Nov. 25-27	10	Biela
Leonid	Nov. 16	15	1866 I
Geminid	Dec. 13	55	—

Date of actual maximum occurrence of counting rate may vary from the above nominal date by one or two days in either direction from year to year. Also, the best time to observe these meteor showers is after midnight, when the rotation of the earth is in the opposite direction to the motion of the meteor stream.

BRIGHT STARS, 1983

The upper table shows the Eastern Standard Time when each star transits the meridian of Boston (i.e., lies directly above the horizon's south point there), and its altitude above that point at transit on the dates shown. The time of transit on any other date differs from that on the nearest date listed by approximately four minutes of time for each day. For a place outside Boston the local time of the star's transit is found by correcting the time at Boston by the value of Key Letter "C" for the place. (See footnote.)

Star	Constellation	Magni- tude	Time of Transit (E.S.T.)							Alt.
			Boldface—P.M. Lightface—A.M.							
			Jan. 1	Mar. 1	May 1	July 1	Sept. 1	Nov. 1		
Altair	Aquila	0.9	12 51	8 59	4 59	0 59	8 51	4 51	56.3	
Deneb	Cygnus	1.3	1 42	9 50	5 50	1 50	9 42	5 42	87.5	
Fomalhaut	Psc. Austr.	1.3	3 56	12 04	8 04	4 04	0 01	7 57	17.8	
Algol	Perseus	var.	8 07	4 15	12 15	8 15	4 11	0 12	88.5	
Aldebaran	Taurus	1.1	9 34	5 42	1 42	9 43	5 39	1 39	64.1	
Rigel	Orion	0.3	10 13	6 21	2 21	10 21	6 17	2 17	39.4	
Capella	Auriga	0.2	10 14	6 22	2 22	10 23	6 19	2 19	85.4	
Bellatrix	Orion	1.7	10 23	6 31	2 31	10 32	6 28	2 28	54.0	
Betelgeuse	Orion	var.	10 53	7 01	3 01	11 02	6 58	2 58	55.0	
Sirius	Can. Maj.	-1.6	11 43	7 51	3 51	11 51	7 47	3 48	31.0	
Procyon	Can. Min.	0.5	0 41	8 45	4 45	0 45	8 41	4 41	52.9	
Pollux	Gemini	1.2	0 47	8 51	4 51	0 51	8 47	4 47	75.7	
Regulus	Leo	1.3	3 10	11 14	7 14	3 14	11 10	7 10	59.7	
Spica	Virgo	1.2	6 26	2 34	10 30	6 30	2 27	10 27	36.6	
Arcturus	Bootes	0.2	7 17	3 25	11 21	7 21	3 17	11 18	66.9	
Antares	Scorpius	1.2	9 30	5 38	1 38	9 34	5 30	1 30	21.3	
Vega	Lyra	0.1	11 37	7 45	3 45	11 41	7 38	3 38	86.4	

Risings and Settings. The times of the star's rising and setting at Boston on any date are found by applying the interval shown to the time of the star's transit on that date. Subtract the interval for the star's rising; add it for its setting. The times for a place outside Boston are found by correcting the times found for Boston by the values of the Key Letters shown. (See footnote.) The directions in which the star rises and sets shown for Boston are generally useful throughout the United States. Deneb, Algol, Capella, and Vega are circumpolar stars — this means that they do not appear to rise or set but are above the horizon.

Star	Int. hr.m.	Rising Key Dir.	Setting Key Dir.	Star	Int. hr.m.	Rising Key Dir.	Setting Key Dir.
Altair	6 36	B EbN	D WbN	Sirius	5 00	D ESE	B WSW
Deneb		A NNE	E NNW	Procyon	6 23	B EbN	D WbN
Fomalhaut	3 59	E SE	A SW	Pollux	8 01	A NE	E NW
Algol	9 28	A NNE	E NNW	Regulus	6 49	B EbN	D WbN
Aldebaran	7 06	B ENE	D WNW	Spica	5 23	D EbS	B WbS
Rigel	5 33	D EbS	B WbS	Arcturus	7 19	A ENE	E WNW
Capella		A NNE	E NNW	Antares	4 17	E SEbE	A SWbW
Bellatrix	6 27	B EbN	D WbN	Vega	9 08	A NNE	E NNW
Betelgeuse	6 31	B EbN	D WbN				

NOTE: The values of Key Letters are given in the Time Correction Tables. (See pages 76-80).

How Old Is the Starlight You'll See Tonight?

If someone on the star Canopus had a powerful enough telescope, he would be able to view the entire San Francisco earthquake and fire of 1906 exactly 21 years from this coming April . . .

by Frederick F. Bird

□ THE SPEED OF LIGHT IS SO GREAT that there are literally no experiences on earth to make us aware of the fact that it really does take time for light to travel a certain distance. The idea becomes real only when we move beyond the earth and into space.

The distance between the earth and the moon is about 250,000 miles. Light travels at 186,000 miles per second, so that sunlight reflecting off the moon's surface takes 1.3 seconds to reach the earth. When men walked on the moon and reported events, the messages took 1.3 seconds to reach the earth because radio waves travel at the speed of light. Still, 1.3 seconds is a barely noticeable delay.

The sun is about 93 million miles away. This means that light from, say, a solar prominence (a surface flare) does not reach the earth for eight minutes. Another way of visualizing the time it takes for light to travel from the sun to the earth is to realize that the image we see of the solar disk is actually where the sun was eight minutes ago.



The greater the distance, the longer the delay. The American spacecraft that photographed Saturn took one hour and 16 minutes to transmit its signals back to earth at the speed of light. And if an astronomer looks at the outermost planet in our solar system, Pluto, the image he sees is how Pluto looked five and one half hours earlier.

Outside our solar system the distances are magnified immensely. The nearest star to the earth is Centauri A, about 25 million million miles away. Using miles as a measure of distance becomes too awkward now, so astronomers use the distance that light travels in one year — a light-year — to measure the distance between stars. One light-year is about six trillion miles. Centauri A is 4.3 light-years away. Light seen tonight from Centauri A was generated on that star in 1979.

The situation can also be reversed. Light from the great San Francisco fire of 1906 has reached out 77 light-years into space. An observer on a planet near the star Canopus will be able to view the entire San Francisco disaster in April of 2004, if he has a telescope large enough.

Here is a simplified sketch of a star map. The circles represent stars with diameters proportional to their brightness. Next to some of the more prominent stars are their names and the dates when the light we see now, twinkling in the heavens, was first generated in the thermonuclear reaction on each star's surface.

□ □



Star	Lt.-Yrs. Distant	When Light Left	Events on Earth
Deneb	1600	A.D. 383	Maximus becomes Emperor of Rome; St. Augustine is 29 yrs. old.
Rigel	900	1083	Christians take Toledo, Spain, from Moslems.
Polaris	680	1303	Marco Polo's memoirs recently published.
Betelgeuse,	520	1463	Gutenberg's Bible seven yrs. old.
Antares			
Beta Centauri*	490	1493	Columbus returns from New World.
Canopus*	98	1885	Washington Monument dedicated.
Auriga	88	1895	Sears, Roebuck mail-order business.
Regulus-	75	1908	Model-T introduced.
Capella	45.	1938	Orson Welles's Martian hoax.
Arcturus	36	1947	Jackie Robinson breaks baseball color line.
Vega	26	1957	Sputnik launched.
Altair	16	1967	First heart transplant.
Alpha Centauri*	4	1979	Accident at Three Mile Island nuclear plant.
*Southern hemisphere			

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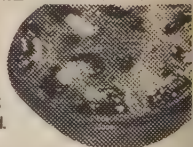
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OW CERTAIN HOLIDAYS

And Just Plain "Days" Came To Be

Ever wonder why the first Monday after January 6th is Plough Monday or why Groundhog Day is always February 2nd or why Boxing Day has nothing to do with pugilism?

by Andrew Rothovius

□ MOST OF THE HOLIDAYS AND other name-remarkable days found on the right-hand calendar pages of the OFA originated from two main sources: the ancient pre-Christian seasonal observances, and the tradition that arose in the third century A.D. of memorializing the days on which noted martyrs for the Christian faith gave up their lives.

Some festival days, of course, derive from other beginnings, such as the Jewish ones based on Old Testament usages and rituals. A few come from the ancient Roman calendar ancestral to our own; a handful are of more or less modern date, mainly commemorating historical events such as the end of World War I (Veterans' Day).

Hhe Romans were of two minds as to when the year should begin: on January 1, when the days were noticeably longer, or at the spring equinox, then on March 25. This confusion lasted in Catholic countries until the calendar was put in its present form by Pope Gregory XIII in 1582, and much longer in Protestant countries (to 1752 in Britain and America). Overlapping the January 1 year-start were the 12 days of the winter solstice celebration, the first of which — December 25 — came in the mid-fourth century A.D. to be identified with the birthday of Christ. The last day was January 6, hence **Twelfth Night** in English folk custom as the end of the Christmas merrymaking. In the church calendar this date came to be called the **Epiphany**, i.e., the manifestation of the infant Christ to the three wise men who came to see Him.

No work used to be done on those 12 joyous days. Not until the first Monday after January 6, **Plough Monday**, were the teams hitched up to start plowing for the spring sowing. In the usually mild winter climate of Western Europe it was feasible to do this in January. The law courts and the schools did not resume their terms until January 14, **St. Hilary's Day**, hence "Hilary Term" often referred to in old chronicles.

As the year progressed, a succession of festive days, some fixed on the same date each year, some varying annually in relation to the great festival of Easter regulated by the equinox full moon, marked the advance of the seasons. The steadily lengthening daylight was hailed by the **Candle-mass** (Candlemas) on February 2, commemorating the Virgin Mary's presenting the baby Jesus in the Temple; earlier it had been the Celtic Iambolc, the feast of light and purification. It was the day on which weather sages tried to foresee the end of the winter, a custom we perpetuate in **Groundhog Day** on the same date. It was also the occasion for young lovers to pair off for springtime marriages. By the 15th century, however, this latter function had been transferred — perhaps because it was felt inappropriate for a day associated with the Virgin — to the February 14 feast of an obscure saint named **Valentine**.

The penitential season of **Lent** followed, preceded by a period of boisterous fun and games culminating on **Shrove Tuesday**, the 48th day before Easter. On that day, after a final round of revelry—still surviving in New Or-

leans' "Mardi Gras," i.e., Fat or Jolly Tuesday — one confessed one's sins and was shriven—i.e., cleared — of them by a priest. Thus properly shrove, the following morning (**Ash Wednesday**) the penitent had his or her forehead marked with ash to signify this contriteness for the beginning Lenten season of abstinence from the pleasures of the flesh.



To remind people of the approach of Lent and Easter, the three Sundays immediately preceding Shrove Tuesday were observed as **Septuagesima**, **Sexagesima**, and **Quinquagesima** — Latin for 70th, 60th, and 50th, indicating roughly the number of days left from each to Easter. There were six Sundays in Lent, the last being **Palm Sunday**. The fourth Sunday was traditionally a break or respite from the austere rigors of the season, and on it boys living away from home, such as apprentices or students, were allowed to go and visit their mothers. It was customary for them to bring a *simnel* — a highly spiced fruit cake — as a suitable present on **Mothering Sunday**.

Usually halfway through Lent was a day of ill omen, the **Ides of March** in the old Roman calendar (the 15th in ours), on which Julius Caesar was assassinated in 46 B.C.; it remained traditionally a bad-luck day, one to be wary of. A little earlier, in the first full week of Lent, occurred the three **Ember Days** — from the old English "ym-bren", i.e., remembering, having nothing to do with embers — on which special fasting and prayer were observed in expiation of past misdeeds. Later it became customary to ordain priests on these and the three other groups of Ember Days occurring in May, September, and December.

The precession of the equinoxes has moved the astronomical beginning of spring forward four days to March 21 in our time, but its previous date of the 25th became identified — in addition to being the alternate year-beginning day — with the Virgin Mary, who was

told by the Angel Gabriel on that day that she would become the mother of Christ nine months later. **Annunciation**, or **Lady Day** as it was more commonly called, was one of the great quarterly dividing-points of the year (the others being Midsummer Day, Michaelmas, and Christmas); as such, it was traditionally the day for paying rents, signing or vacating leases, and hiring farm laborers for the year.

A "feast of fools," on which all sorts of ridiculous tricks were played, had been known since Roman times; in the Middle Ages it was usually held a little before Lent. Then when the Pope fixed January 1 as the official beginning of the year in 1582, this day of foolery shifted to April 1, which thus was no longer the start of the government or civil year as it had been, but so only in joke. From that our **April Fool** tradition developed.



Following Easter, the next great seasonal holiday was **May 1** or **May Day**, the Celtic Beltane, when the cattle were led into the upland pastures for the summer. It lent itself to all sorts of fertility rituals, of which the May Pole is a survivor. The opposite of May Day was November 1, Samhain, or All Saints Day, as Pope Gregory IV named it in A.D. 835 to clear it of its pagan associations; on that day the cattle were brought back into their winter pens.

The Church commemorated Christ's ascension to heaven on a Thursday, the 40th day after Easter. The preceding Sunday was **Rogation Day** (Latin "rogare," to ask), on which prayer was offered for bountiful crops from the sowings just completed. Ten days after **Ascension Day** is **Pentecost** (Greek "50th," the 50th day after Easter), commemorating the descent of the Holy Spirit upon the Apostles (Acts, Chapter 2), usually called **White** or **Whitsunday** from the white robes worn by the newly baptized, the day having long been a favored one for baptisms.

Formerly the sun reached its north-

most point on June 24 (now, by the precession of the equinoxes, on June 21); hence it was called **Midsummer Day**, in terms of sunlight rather than weather. To the church it was the birthday of **St. John the Baptist**, the herald of Christ; the wild flower that blooms at this time, **St. John's Wort**, reputedly had peculiarly effective properties against witches and all other evil. In many lands it is still a festival marked by bonfires and all-night revelry.



*"It used to be the custom
to whip one's own children
soundly on this day . . .
to impress on them how
fortunate they had been."*



Lammas (i.e., Loaf-Mass) **Day**, August 1, the Celtic **Lugnasaid**, hailed the beginning of the wheat harvest. Loaves made from the first new wheat were handed out at Mass. It is usually a time of great heat, which was attributed to the Dog Star, **Sirius**, which rises concurrently with the sun from July 26 through August 11, our traditional **Dog Days**.

The completion of the harvest was marked by **Harvest Home** celebrations that varied in date by locality and weather, though a **Feast of the Ingathering** attained some stature on the fixed date of September 24. It was overshadowed, though, by **Michaelmas**, the festival of **St. Michael the Archangel** and overcomer of the Devil, on September 29. In addition to being the terminal date of the growing season, it was one of the four great quarterly dividing

points of the year, and like **Lady Day** in March, a day for settling rents, making or breaking leases, paying off laborers and hiring new ones. The custom of electing municipal officials at **Michaelmas** also grew, presumably so they might be under **Michael's** protection.

Soon it was time to bring the cattle in from the pastures, on November 1, the day whose associations of darkness were turned by the church into a festival honoring **All Saints** in general. The souls of all others who had left this mortal life were remembered by special masses the next day, November 2, **All Souls**. The twin days were referred to together as **All Hallows**, and the preceding day — October 31 — thus became **All Hallows' Eve** or **E'en**, now **Hallowe'en**, when the powers of evil were allowed their fling before the sanctified pair of days that followed.

Some of the fattened cattle now had to be slaughtered and the meat salted for the winter; this task became associated with **Martinmas**, November 11, the day honoring the apostle of Celtic Gaul — now France — in the fourth century A.D. Now the winter solstice and **Christmas** approached, and gifts had to be prepared to give to the poor and to family and friends. The distribution to the poor was on December 21, the feast day of **St. Thomas the Doubter**, so that recipients would have something to celebrate with. The other gifts, done up in ribboned boxes, were not exchanged until the day after Christmas; hence the old English name of **Boxing Day** — having no connection with pugilism — for December 26.

Perhaps one of the oddest of festivals was **Holy Innocents Day**, December 28, honoring the children of Bethlehem slain by King Herod in his mad attempt to kill the infant Christ. It used to be the custom to whip one's own children soundly on this day to remind them of those poor slaughtered unfortunates and to impress on them how fortunate they were to have had their own bountiful **Yuletide** holiday. □□

1982

NOVEMBER, THE ELEVENTH MONTH

Most planets are too close to the sun to see well now. On the 1st, Mercury and Saturn form a close pair low in the east in morning twilight, with Mercury far the brighter. Just after sunset on the 19th, most East Coast observers north of Norfolk can find Mars right at the edge of the lunar crescent; many people in the Southeast can actually see Mars occulted (hidden) by the moon then. The Milky Way arches from east to west. Look for the brilliant K-shape of Perseus in the northeast. The conspicuous little group of stars called the Pleiades (or Seven Sisters) ascends in the east, with Aldebaran below it. Look for some Leonid meteors from high in the south a few hours before dawn on the 17th and 18th. There are two full moons this month — something that will happen only once more in the next five years.

ASTRONOMICAL CALCULATIONS

○ Full Moon	1st day,	7th hour	58 min.
☾ Last Quarter	8th day,	1st hour	39 min.
● New Moon	15th day,	10th hour	11 min.
☾ First Quarter	23rd day,	15th hour	6 min.
○ Full Moon	30th day,	19th hour	22 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	Rises h. m.	Key	Sets h. m.	Key	Length of Days h. m.	Sun Fast m.	Full Sea Boston A.M. P.M.	Rises h. m.	Key	Sets h. m.	Key	Declination of sun °	Place
305	1	M.	6 17	D	4 38	B	10 21	31	10 11	5 ^M 09	B	6 ^M 06	E	14s. 28	CET
306	2	Tu.	6 19	D	4 37	B	10 18	31	11 11	5 44	B	7 20	E	14 47	ARI
307	3	W.	6 20	D	4 35	B	10 15	31	—	12 14	B	8 34	E	15 06	TAU
308	4	Th.	6 21	D	4 34	B	10 13	31	12 3 4	1 7 15	B	9 47	E	15 25	TAU
309	5	Fr.	6 22	D	4 33	B	10 11	31	1 1 2	8 14	B	10 54	E	15 43	GEM
310	6	Sa.	6 24	D	4 32	A	10 08	31	2 2 3	9 20	B	11 53	E	16 01	GEM
311	7	C	6 25	D	4 31	A	10 06	31	3 3 3	10 29	B	12 43	E	16 19	CAN
312	8	M.	6 26	D	4 30	A	10 04	31	4 4 4	11 40	B	1 24	E	16 37	CAN
313	9	Tu.	6 27	D	4 28	A	10 01	31	5 5 6	—	—	1 58	D	16 54	LEO
314	10	W.	6 29	D	4 27	B	9 58	31	6 6 7	12 51	C	2 28	D	17 11	LEO
315	11	Th.	6 30	D	4 26	B	9 56	31	7 7 8	1 59	C	2 56	D	17 28	VIR
316	12	Fr.	6 31	D	4 25	B	9 54	31	8 8 9	3 06	D	3 21	C	17 44	VIR
317	13	Sa.	6 32	D	4 24	B	9 52	31	9 9 10	4 11	D	3 46	C	18 00	VIR
318	14	C	6 34	D	4 23	A	9 49	31	10 10 11	5 17	E	4 14	B	18 16	VIR
319	15	M.	6 35	D	4 23	A	9 48	30	10 3 4	6 21	E	4 43	B	18 31	LIB
320	16	Tu.	6 36	D	4 22	A	9 46	30	11 1 2	7 23	E	5 16	B	18 46	LIB
321	17	W.	6 37	D	4 21	A	9 44	30	12 12	8 24	E	5 54	B	19 01	OPH
322	18	Th.	6 38	D	4 20	A	9 42	30	12 12 3	9 22	E	6 37	A	19 15	SAG
323	19	Fr.	6 40	D	4 19	A	9 39	30	1 1 4	10 14	E	7 25	A	19 29	SAG
324	20	Sa.	6 41	D	4 19	A	9 38	29	2 2 4	11 01	E	8 18	B	19 43	SAG
325	21	C	6 42	D	4 18	A	9 36	29	2 3 4	11 42	E	9 15	B	19 57	CAP
326	22	M.	6 43	D	4 17	A	9 34	29	3 3 4	12 18	E	10 15	B	20 10	CAP
327	23	Tu.	6 45	D	4 17	A	9 32	29	4 4 4	12 49	D	11 17	B	20 23	CAP
328	24	W.	6 46	D	4 16	A	9 30	28	5 5 4	1 17	D	—	—	20 34	AQU
329	25	Th.	6 47	D	4 15	A	9 28	28	6 6 4	1 43	D	12 20	C	20 46	AQU
330	26	Fr.	6 48	E	4 15	A	9 27	28	7 7 4	2 09	D	1 24	D	20 58	PSC
331	27	Sa.	6 49	E	4 14	A	9 25	27	7 8 4	2 36	C	2 31	D	21 09	CET
332	28	C	6 50	E	4 14	A	9 24	27	8 9 4	3 04	B	3 41	E	21 19	PSC
333	29	M.	6 51	E	4 14	A	9 23	27	9 9 4	3 37	B	4 54	E	21 30	ARI
334	30	Tu.	6 52	E	4 13	A	9 21	26	10 10 4	4 16	B	6 09	E	21s. 40	TAU

NOVEMBER hath 30 days.

1982



From gold to gray our milk sweet day
Of Indian summer fades too soon;
But tenderly above the sea
Hangs, white and calm, the hunter's moon.
— John Greenleaf Whittier

Farmer's Calendar

Around the houses people are preparing for winter. They are gathering their forces and seeing to their defenses. As you drive along the roads and watch the houses being made ready according to their owners' differing ideas and situations, you get the impression of a military operation from the days when war was waged by laying siege to fortified villages. The walls and gates had to be made strong, the approaches to them had to be cleared, armaments and supplies had to be laid in, water sources secured, watches organized. The defenders gave much work and ingenuity to the problem of keeping the opposition out and keeping the inhabitants safe within. Something like the same end is in view now, late in the fall, when the houses are girded and made tight against winter.

Going about the neighborhood observing everyone's preparations for winter is not, so far as I know, a seasonal tradition as well established as, say, making the same circuit in June to look at everyone's flower gardens. I prefer it, though. I would rather see what Mr. A. has fixed up to keep the ice from caving in the roof of his shed this winter than I would what Mr. B.'s poppies are doing. Another thing I like to see around this time of year is how people and their houses have reversed the normal seasonal progression of the rest of nature. Our fall is like nature's spring. At the same time that nature is stripping down, contracting, and shutting up, our houses seem to expand and flower forth with foundation banking, snow fences, storm windows, vestibules, wood-piles, and the little wooden pyramids householders place over their planted shrubs.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	M.	All Saints • ♀ ♀ ♀ • Full Beaver • {10.9 10.3	Mop
2	Tu.	All Souls • Election Day • Tides {11.2 10.3	up
3	W.	♀ sup. ♀ • A curdly sky Will not leave the earth long dry. • those	
4	Th.	at peri. • Great Vt. flood killed 24, 1927 • {10.2 11.4	raindrops.
5	Fr.	Guy Fawkes' Plot • (at ☉ • Tides {9.9 11.1	Climb
6	Sa.	runs high • 98 m.p.h. winds, Block Island, R.I., 1953 • {9.6 10.8	a peak
7	C	23 rd S. af. P. • F.D.R. won fourth term, 1944 • this	
8	M.	Thunder in November means a fertile year to come. • Tides {9.1 10.0	cool
9	Tu.	Margaret Sanger formed American Birth Control League, 1921 • {9.1 9.7	week.
10	W.	Silence is not always a sign of wisdom, But babbling is ever a folly. • No hoax,	
11	Th.	St. Martin • Veterans Day • Tides {9.6 9.6	wear
12	Fr.	on Elizabeth Cady Stanton b. 1815 • {9.9 9.7	rain cloaks.
13	Sa.	Sadie Hawkins • ♀ ♀ ☉ • ♀ ♀ ☉ • Sleet	
14	C	24 th S. af. P. • Frederick Jackson Turner b. 1861	will
15	M.	New • Felix Frankfurter b. 1882 • {10.4 9.4	freeze
16	Tu.	If ice in November will bear a duck, Nothing comes after but sleet and muck. • {10.3 —	your feet.
17	W.	Hernando de Soto arrived at site of Mobile, Ala., 1539	
18	Th.	Occult. ♀ ☉ • (at ☉ • George Gallup b. 1901	Treat
19	Fr.	♀ sup. ☉ • Occult. ♀ ☉ • W.C.T.U. organized, 1874 • this	
20	Sa.	at Peregrine White born aboard Mayflower, 1620 • {8.5 9.3	respice
21	C	25 th S. af. P. • Tides {8.3 9.0	with
22	M.	St. Cecilia • Prune grape-vines now. • {8.1 8.8	delight.
23	Tu.	St. Clement • 56" snow, Randolph, N.H., 1943 • {8.0 8.6	Need
24	W.	For Age and and Want save while you may; No morning sun lasts a whole day. • a sleigh	
25	Th.	Thanksgiving Day • 57" snow, Pickens, West Virginia, 1950 • this	
26	Fr.	on 1st streetcar railway in U.S. • New York City, 1832. Fare 12½¢. • holiday.	
27	Sa.	♀ ☉ • Liberty Bell welcomed Washington to Philadelphia, 1781	Clear,
28	C	Advent • Coconut Grove nightclub fire, Boston, 1942 • means	
29	M.	Louisa May Alcott b. 1832 • Space chimp Enos orbited Earth twice, 1961 • winter's	
30	Tu.	St. Andrew • Full Hunting • ☉ • Mark Twain b. 1835 • near.	

The man who is a pessimist before 48 knows too much;
The man who is an optimist after 48 knows too little.

1982

DECEMBER, THE TWELFTH MONTH

The shortest day of the year begins at 11:39 P.M., December 21st. As many as 60 Geminid meteors per hour may be seen zooming from very high in the south after midnight, early on the 14th. The second total eclipse of the moon for North America will occur on the morning of the 30th, the last total eclipse most of us will see for many years. The partial phase starts at 4:50 A.M. EST; totality lasts from 5:58 A.M. to 6:59 A.M. Cygnus the Swan now is setting in the west as an upright cross; Aldebaran is in the southeast. Lower in the east is Orion the Hunter, whose three-star Belt is a vertical line when he rises. Mercury is at its farthest elongation east of the sun on the 30th, low in the west during the last week.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	7th day,	10th hour	54 min.
● New Moon	15th day,	4th hour	19 min.
☾ First Quarter	23rd day,	9th hour	18 min.
○ Full Moon	30th day,	6th hour	34 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	Rises h. m.	Key	Sets h. m.	Key	Length of Days h. m.	Sun Past m.	Full Sea Boston A.M. P.M.	Rises h. m.	Key	Sets h. m.	Key	Declination of sun °	Place	Age
335	1	W.	6 54	E	4 13	A	9 19	26	11 11½	5 ^M 03	B	7 ^A 25	E	21s.49	TAU	16
336	2	Th.	6 55	E	4 13	A	9 18	26	11 —	6 00	A	8 38	E	21 58	TAU	17
337	3	Fr.	6 56	E	4 12	A	9 16	25	12 12½	7 05	B	9 43	E	22 07	GEM	18
338	4	Sa.	6 57	E	4 12	A	9 15	25	1 —	8 16	B	10 39	E	22 15	CAN	19
339	5	C	6 58	E	4 12	A	9 14	24	2 —	9 29	B	11 ^A 24	E	22 23	CAN	20
340	6	M.	6 59	E	4 12	A	9 13	24	3 3	10 42	C	12 ^M 01	D	22 30	LEO	21
341	7	Tu.	7 00	E	4 12	A	9 12	24	4 4	11 ^M 51	C	12 33	D	22 37	LEO	22
342	8	W.	7 01	E	4 12	A	9 11	23	5 5	—	—	1 01	D	22 43	VIR	23
343	9	Th.	7 01	E	4 12	A	9 11	23	6 6	12 ^A 58	D	1 26	C	22 50	VIR	24
344	10	Fr.	7 02	E	4 12	A	9 10	22	7 7	2 04	D	1 51	C	22 55	VIR	25
345	11	Sa.	7 03	E	4 12	A	9 09	22	8 8	3 08	E	2 17	B	23 00	VIR	26
346	12	C	7 04	E	4 12	A	9 08	21	9 9	4 12	E	2 46	B	23 05	LIB	27
347	13	M.	7 05	E	4 12	A	9 07	21	9 9½	5 14	E	3 16	B	23 09	LIB	28
348	14	Tu.	7 06	E	4 12	A	9 06	20	10 10½	6 15	E	3 52	B	23 13	OPH	29
349	15	W.	7 06	E	4 12	A	9 06	20	11 11½	7 14	E	4 33	B	23 16	OPH	0
350	16	Th.	7 07	E	4 13	A	9 06	19	11 12	8 09	E	5 19	B	23 19	SAG	1
351	17	Fr.	7 08	E	4 13	A	9 05	19	12 12½	8 57	E	6 11	A	23 21	SAG	2
352	18	Sa.	7 08	E	4 13	A	9 05	18	1 —	9 40	E	7 07	B	23 23	SAG	3
353	19	C	7 09	E	4 14	A	9 05	18	1 1½	10 18	E	8 05	B	23 24	CAP	4
354	20	M.	7 10	E	4 15	A	9 05	17	2 2½	10 50	E	9 06	B	23 25	CAP	5
355	21	Tu.	7 10	E	4 15	A	9 05	17	3 3½	11 19	D	10 07	C	23 26	AQU	6
356	22	W.	7 11	E	4 16	A	9 05	17	3 3½	11 45	D	11 ^M 10	C	23 26	AQU	7
357	23	Th.	7 11	E	4 16	A	9 05	16	4 4½	12 ^M 10	D	—	—	23 26	PSC	8
358	24	Fr.	7 11	E	4 16	A	9 05	16	5 5½	12 35	C	12 ^A 13	D	23 25	CET	9
359	25	Sa.	7 12	E	4 17	A	9 05	15	6 6½	1 02	C	1 19	D	23 23	PSC	10
360	26	C	7 12	E	4 18	A	9 06	15	7 7½	1 31	B	2 28	E	23 21	CET	11
361	27	M.	7 13	E	4 19	A	9 06	14	8 8½	2 06	B	3 40	E	23 19	ARI	12
362	28	Tu.	7 13	E	4 19	A	9 06	14	8 9½	2 48	B	4 55	E	23 16	TAU	13
363	29	W.	7 13	E	4 20	A	9 07	13	9 9½	3 39	B	6 10	E	23 13	TAU	14
364	30	Th.	7 13	E	4 20	A	9 07	13	10 10½	4 42	B	7 21	E	23 09	GEM	15
365	31	Fr.	7 13	E	4 21	A	9 08	12	11 11½	5 ^M 52	B	8 ^A 23	E	23s.05	GEM	16



Now winter nights enlarge
The number of their hours;
And clouds their storms discharge
Upon the airy towers.

— Thomas Campion

Farmer's Calendar

In years when snow comes late, December furnishes a fifth season not a part of other years. I have read some writers in New England who call this interval "locking time." It is a distinctive time, having its own weather, colors, and themes, as much as the commoner, longer seasons have. A bare December's weather is hard cold, its colors gray and green, and its theme is solitude. Every bird, animal, and insect that is going to migrate, hibernate, or die off is gone, and the population of the land is reduced. Even the people have gone, many of them, and it may seem that nobody is left to keep company with except the deer and chickadees.

The leaves are gone. They no longer show their fall colors, even lying on the ground. In the woods the color in this season comes only from the trunks and branches of the hardwood trees, which are every shade of gray, and from the conifers, which are a dark green nothing like the green of spring. I have forgotten the birches, whose trunks are white and lie on the dark hillsides like silver threads on a woolen blanket.

A bare December is a cold season. It has none of the fading heat of autumn. The skies are seldom clear and blue as they are in the real autumn. It's a winter sky, gray and full of changing clouds. The earth is as hard and cold as an iron spike. The back roads are full of dust because the ground is frozen and therefore dry. It's curious to see a cloud of dust following a car in December, but this dust isn't like summer dust. This dust is cold. Every so often the sky will fill with snow, but the snow will stop soon and leave the ground bare again. And then one day the snow won't stop.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	W.	<i>The thinner the ice, the more anxious is everyone to see whether it will bear.</i> • {11.6	Balmy
2	Th.	• {10.2	
3	Fr.	• Model A introduced by Ford, 1927	and
4	Sa.	• Beggar's Opera opened in New York City, 1750 • {10.1	mild
5	C	• Lillian Russell • Chicago police raided Black Panthers, 1969 • {11.7	turns to
6	M.	2 nd S. Advent • Phi Beta Kappa founded, 1776	bleak
7	Tu.	St. Nicholas • Americans took 1st legal drink in 13 years, 1933 • {9.6	and
8	W.	Teach your child to hold his tongue; he'll learn fast enough to speak. • {10.4	wild.
9	Th.	Concept. of V.M. • ♀♂♂♂ • Tides {9.4	Get
10	Fr.	• on 61° Boston, Mass., • Emmett Kelly • {9.5	out
11	Sa.	• Eq. at 1:00 a.m., 1980 • b. 1898	snow
12	C	• Woodrow Wilson received Nobel Peace Prize, 1920 • {9.6	fences
13	M.	27° San Francisco, Cal., 1932 • Fiorello La Guardia • {9.0	before
14	Tu.	3 rd S. Advent • Tides {9.9	the blast
15	W.	St. Lucy • ♀♂♂♂ • the blast	commences.
16	Th.	Gen. James H. • 12' snow • Doolittle b. 1896 • drifts, N.M., 1959	Fire up
17	Fr.	Ember Day • New • Eclipse •	the
18	Sa.	• Boston Tea Party, 1773 • Variety published, 1905	stove,
19	C	Ember Day • at apo. • runs low • {8.7	please,
20	M.	Ember Day • ♀♂♂♂ • {8.8	then cut
21	Tu.	4 th S. Advent • Tides {9.4	down
22	W.	Halcyon days of calm seas. • 1st built-in bathtub, Cincinnati, O., 1842 •	your
23	Th.	St. Thomas • Pilgrims landed, Plymouth Rock, 1620 • Solstice 11:39 p.m. EST	Christmas
24	Fr.	A bachelor gets tangled up with a lot of women in order to avoid getting tied up to one. • {8.8	trees.
25	Sa.	Cornelius McGillicuddy • Joseph Smith (Connie Mack) b. 1862 • b. 1805	No more
26	C	• If windy on Christmas Day, trees will bear much fruit. • {8.6	St. Stephen
27	M.	Christmas • Sir Isaac Newton b. 1642	to
28	Tu.	1 st S. at Christmas • St. Stephen	tell —
29	W.	St. John • Showboat opened on Broadway, 1927 • Tides {10.2	a
30	Th.	Holy Innocents' Day • Woodrow Wilson b. 1856 • {9.2	snowy
31	Fr.	• Battle of Wounded Knee, S.D., 1890 • Tides {11.3	farewell!
		• Full Cold • Eclipse • ♀♂♂♂ • Gr. Elong. • E. 20° • at peri.	
		St. Sylvester • With bounteous cheer, Conclude the year.	

1983

JANUARY, THE FIRST MONTH

In the middle of frigid January evenings, Orion the Hunter, brightest of the starry constellations, stands upright in the south. The red star in his shoulder is Betelgeuse, the blue star in his knee is Rigel. Follow the line of his Belt to the upper right for Aldebaran in Taurus, to the lower left for Sirius, brightest of all stars. High above Orion is Auriga, with bright star Capella ("she-goat") and three much fainter stars ("the Kids"). Before dawn, the southeast will be occupied by Orion's enemy, Scorpius, with Jupiter near the star Beta in the Scorpion's head on the 10th. Some Quadrantid meteors may be spotted coming from the northeast before morning twilight on the 4th. The earth will be at perihelion on the 2nd.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	5th day,	23rd hour	1 min.
● New Moon	14th day,	0 hour	9 min.
☾ First Quarter	22nd day,	0 hour	35 min.
○ Full Moon	28th day,	17th hour	27 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☀ Rises h. m.	Key	☀ Sets h. m.	Key	Length of Days h. m.	Sun Fast	Full Sea Boston	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declination of sun °	☾ Place	☾ Age	
1	1	Sa.	7 14	E	4 22	A	9 08	12	12 1/4	12 1/2	7 ^P _M 08	B	9 ^A _M 15	E	23s.00	CAN	17
2	2	B	7 14	E	4 23	A	9 09	11	1	1 1/4	8 24	C	9 58	E	22 55	LEO	18
3	3	M.	7 14	E	4 24	A	9 10	11	2	2 1/4	9 38	C	10 33	D	22 49	LEO	19
4	4	Tu.	7 14	E	4 25	A	9 11	10	2 3/4	3 1/4	10 48	D	11 03	D	22 43	LEO	20
5	5	W.	7 14	E	4 26	A	9 12	10	3	4 1/4	11 ^P _M 55	D	11 31	D	22 37	VIR	21
6	6	Th.	7 14	E	4 27	A	9 13	9	4	5 1/4	—	—	11 ^A _M 56	C	22 30	VIR	22
7	7	Fr.	7 13	E	4 28	A	9 15	9	5	6 1/4	1 ^A _M 00	D	12 ^P _M 22	B	22 23	VIR	23
8	8	Sa.	7 13	E	4 29	A	9 16	8	6 1/4	7 1/4	2 04	E	12 49	B	22 15	LIB	24
9	9	B	7 13	E	4 30	A	9 17	8	7 1/4	8 1/4	3 07	E	1 19	B	22 06	LIB	25
10	10	M.	7 13	E	4 31	A	9 18	8	8	9	4 08	E	1 53	B	21 57	OPH	26
11	11	Tu.	7 13	E	4 32	A	9 19	7	9 3/4	9 3/4	5 08	E	2 32	A	21 48	OPH	27
12	12	W.	7 12	E	4 33	A	9 21	7	10	10 1/2	6 04	E	3 16	A	21 39	SAG	28
13	13	Th.	7 12	E	4 34	A	9 22	6	10 3/4	11 1/2	6 54	E	4 06	A	21 29	SAG	29
14	14	Fr.	7 12	E	4 36	A	9 24	6	11 1/4	11 3/4	7 40	E	5 00	B	21 18	SAG	0
15	15	Sa.	7 11	E	4 37	A	9 26	6	—	12	8 19	E	5 58	B	21 08	CAP	1
16	16	B	7 11	E	4 38	A	9 27	5	12 1/2	12 1/2	8 52	E	6 58	B	20 57	CAP	2
17	17	M.	7 10	E	4 39	A	9 29	5	1	1 1/4	9 22	D	7 59	C	20 45	AQU	3
18	18	Tu.	7 10	E	4 40	A	9 30	5	1 3/4	2	9 49	D	9 00	C	20 33	AQU	4
19	19	W.	7 09	E	4 42	A	9 33	4	2	2 3/4	10 14	D	10 03	D	20 20	AQU	5
20	20	Th.	7 08	E	4 43	A	9 35	4	3	3 1/2	10 38	C	11 ^P _M 06	D	20 07	CET	6
21	21	Fr.	7 08	E	4 44	A	9 36	4	4	4 1/4	11 03	C	—	—	19 54	CET	7
22	22	Sa.	7 07	E	4 45	A	9 38	3	4 3/4	5 1/4	11 ^A _M 30	B	12 ^A _M 11	E	19 41	PSC	8
23	23	B	7 06	E	4 47	A	9 41	3	5	6 1/4	12 ^P _M 01	B	1 20	E	19 28	ARI	9
24	24	M.	7 05	E	4 48	A	9 43	3	6	7 1/4	12 37	B	2 31	E	19 13	TAU	10
25	25	Tu.	7 05	E	4 49	A	9 44	3	7	8 1/4	1 22	B	3 44	E	18 58	TAU	11
26	26	W.	7 04	D	4 50	A	9 46	3	8	9	2 18	A	4 55	E	18 43	TAU	12
27	27	Th.	7 03	D	4 52	A	9 49	2	9	10	3 23	B	6 02	E	18 28	GEM	13
28	28	Fr.	7 02	D	4 53	A	9 51	2	10 1/4	11	4 38	B	6 59	E	18 12	CAN	14
29	29	Sa.	7 01	D	4 54	A	9 53	2	11 1/4	11 3/4	5 56	B	7 48	E	17 56	CAN	15
30	30	B	7 00	D	4 56	A	9 56	2	—	12 1/4	7 13	C	8 28	D	17 40	LEO	16
31	31	M.	6 59	D	4 57	A	9 58	2	12 3/4	1	8 ^P _M 27	D	9 ^A _M 01	D	17s.23	LEO	17



One night came Winter noiselessly, and leaned
Against my windowpane.
In the deep stillness of his heart convened
The ghosts of all his slain.

— Charles G.D. Roberts

Farmer's Calendar

This happens half a dozen times each winter, but I am never ready for it. It is snowing hard at bedtime, and I sleep the way you are supposed to sleep on a snowy night when you're in a warm bed in a warm house. Suddenly I am ripped violently from sleep by a rattling, roaring noise that makes the whole house shake as though the devil were racing the Wabash Cannonball through the cellar. The hour is some black recess of the night, and I am sitting bolt upright in bed, my heart racing, my frightened senses questing about me trying to figure out what is going on. Then I hear the final soft rush and thump from outdoors. The roof. The snow has slid off the roof. I am lying down again.

My roof is metal and steep. It sheds snow pretty easily, and sliding snow plays on it as though the roof were an instrument. There is the delicate swish that a couple of inches of light snow makes as it slides away. There is the louder bumping rush of heavy, icy snow. And there is the full-scale avalanche that shakes the timbers of the house. This is not the best house I have lived in for snowslide effects, though. For the loudest, longest, most unnerving releases of the greatest quantities of snow, you want a slate roof. Slate roofs hold onto their snow, and when it slides it's a big event. I once lived in a big old place that had a roof area a little smaller than a football field. It was all in slate. It held the snow and ice, releasing its burden only a few times each winter. When the snow slid off that roof it usually took several slates with it, and it came down like a vengeful dragon in a long, grating, crashing roar full of screeches made by the loose slates scraping and skidding along the roof. In that house you stayed awake for a while after the roof let go.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Sa.	Circumcision • New Year's Day First	
2	B	⊕ at perihelion, 11 A.M. Tides [10.1 11.5	clear,
3	M.	<i>How swiftly doth time pass away when happiness completes the day.</i> Tides [10.0 11.0	then
4	Tu.	Snow and gale hit Washington's army at Morristown, N.J., 1780 [10.4	• flakes
5	W.	Ⓒ on Eq. • Ark. creationism law nullified, 1982 Tides [9.7 9.8	appear.
6	Th.	Epiphany ♀ stat. • Carl Sandburg b. 1878 [9.5 8.7	Cold
7	Fr.	♂ ♀ ♀ • ♂ ♀ ♂ • Great Plains blizzard, 1873 [8.7	and
8	Sa.	Bartender Fernand Petiot, inventor of bloody mary, d. 1975 • [9.5 8.4	dowdy —
9	B	1st S. af. Epiph. ♂ ♀ Ⓒ Tides [9.5 8.2	to
10	M.	♂ ♂ Ⓒ • Coldest day of 20th cen- tury, Upper Midwest, 1982 • [9.6 8.3	snow
11	Tu.	St. Hilary Hudson luxury 4-door sedan introduced, 1913 [8.3	say
12	W.	Ⓒ at Ⓒ • Frankfurters dubbed "victory sausage" for duration, 1943 • [8.6 8.4	howdy!
13	Th.	Ⓒ runs low • Air Florida jet crash, Washington, D.C., 1982 Tides [9.8 8.4	Teeth
14	Fr.	New • Ⓒ at apo. • FDR at Casablanca conference, 1943 [8.9 8.7	a-chatter.
15	Sa.	♂ ♀ Ⓒ • ♀ inf. • Pentagon com- pleted, 1943 Tides [9.8	but
16	B	2nd S. af. Epiph. • ♂ ♂ Ⓒ [8.6 9.6	snow
17	M.	<i>Never read any book that is not a year old.</i> • Tides [8.7 9.4	won't
18	Tu.	4.8 Earthquake, Franklin, N.H., 1982 [9.7 9.2	matter.
19	W.	"Cold Friday" in New • Tides [9.7 9.2	Pull up
20	Th.	Ⓒ on Eq. • Favorable day for birth of males. • Tides [8.8 8.9	the
21	Fr.	St. Agnes Stonewall Jackson b. in W. Va., 1824 [8.9 8.7	quilt —
22	Sa.	St. Vincent 75% of North America covered by snow, 1982 [9.1 8.5	snow
23	B	3rd S. af. Epiph. Anna Pavlova d. 1931 [8.9 8.7	to
24	M.	First beer sold in cans, Richmond, Va., 1935 • [10.1 8.8	the
25	Tu.	Conversion of Paul • Raccoons mate. • Tides [10.6 9.1	hilt.
26	W.	Ⓒ at Ⓒ • The best sauce in the world is hunger. Tides [11.1 9.5	Wish
27	Th.	Ⓒ runs high • ♀ stat. • Tides [11.5 9.9	this
28	Fr.	Full Wolf • Ⓒ at peri. • Tides [11.7 10.3	filly
29	Sa.	Edgar Allan Poe pub- lished "The Raven," 1845 • [11.7 10.3	weren't
30	B	Septuagesima First "Lone Ranger" broadcast, 1933 [10.4 11.4	so
31	M.	Fell your timber during the waning moon. • Tides [10.4 11.4	chilly.

1983

FEBRUARY, THE SECOND MONTH

The great Evening Star, the planet Venus, is higher in the west after sunset each night. On the 18th, Venus will be only 0.5 degrees south of Mars. The latter is relatively dim, but this conjunction is the closest we'll see between these two planets for more than eight years. After Venus sets, the brightest star, Sirius, becomes the most brilliant point of light in the sky. It is in the south these evenings, marking the head or heart of Canis Major, the Big Dog of Orion. Watch it shoot rays of many colors on nights of unsteady atmosphere or when it is low. The winter Milky Way passes between Sirius and the bright star to its upper left, Procyon, which is in Canis Minor. Several hours before dawn, Jupiter is the bright object in Scorpius. This month it overtakes dim Uranus for the first time since 1969. Candlemas Day, the 2nd, marks the half-way point of the winter. A more familiar name to most people is Groundhog Day.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	4th day,	14th hour	18 min.
● New Moon	12th day,	19th hour	32 min.
☾ First Quarter	20th day,	12th hour	33 min.
○ Full Moon	27th day,	3rd hour	59 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☺ Rises h. m.	Key	☺ Sets h. m.	Key	Length of Days h. m.	Sun Fast	Full Sea Boston A.M. P.M.	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declina- tion of sun °	☾ Place	☾ Age
32	1	Tu.	6 58	D	4 58	A	10 00	1	1 1/2	2 9 ^M 39	D	9 ^A 30	D	17s.06	VIR	18
33	2	W.	6 57	D	4 59	A	10 02	1	2 1/2	2 10 48	D	9 58	C	16 49	VIR	19
34	3	Th.	6 56	D	5 01	A	10 05	1	3 1/2	3 11 ^P 54	E	10 24	B	16 32	VIR	20
35	4	Fr.	6 55	D	5 02	A	10 07	1	4 1/2	— —	—	10 52	B	16 14	LIB	21
36	5	Sa.	6 54	D	5 03	A	10 09	1	5	5 12 ^A 59	E	11 21	B	15 56	LIB	22
37	6	B	6 53	D	5 05	A	10 12	1	6	6 2 01	E	11 ^A 53	B	15 53	SCO	23
38	7	M.	6 52	D	5 06	B	10 14	1	7	7 3 02	E	12 ^M 30	A	15 19	OPH	24
39	8	Tu.	6 50	D	5 07	B	10 17	1	8	8 3 58	E	1 12	B	15 00	SAG	25
40	9	W.	6 49	D	5 09	B	10 20	1	8 3/4	9 4 51	E	2 01	B	14 41	SAG	26
41	10	Th.	6 48	D	5 10	B	10 22	1	9 1/2	10 5 38	E	2 54	B	14 22	SAG	27
42	11	Fr.	6 47	D	5 11	B	10 24	1	10 1/4	10 6 19	E	3 51	B	14 02	CAP	28
43	12	Sa.	6 45	D	5 12	B	10 27	1	11 1/2	11 6 54	E	4 51	B	13 42	CAP	0
44	13	B	6 44	D	5 14	B	10 30	1	11 1/2	— 7 25	E	5 52	C	13 22	AQU	1
45	14	M.	6 43	D	5 15	B	10 32	1	12 1/2	12 7 53	D	6 54	C	13 02	AQU	2
46	15	Tu.	6 41	D	5 16	B	10 35	1	12 3/4	12 8 18	D	7 56	C	12 42	AQU	3
47	16	W.	6 40	D	5 18	B	10 38	1	1 1/4	1 8 42	D	8 59	D	12 21	PSC	4
48	17	Th.	6 38	D	5 19	B	10 41	1	2	2 9 06	C	10 03	D	12 00	CET	5
49	18	Fr.	6 37	D	5 20	B	10 43	1	2 1/2	3 9 32	B	11 ^P 09	E	11 39	PSC	6
50	19	Sa.	6 36	D	5 21	B	10 45	1	3 1/4	3 10 01	B	— —	—	11 18	ARI	7
51	20	B	6 34	D	5 23	B	10 49	1	4 1/4	4 10 34	B	12 ^A 18	E	10 56	TAU	8
52	21	M.	6 33	D	5 24	B	10 51	1	5	5 11 ^A 14	B	1 27	E	10 35	TAU	9
53	22	Tu.	6 31	D	5 25	B	10 54	1	6	6 12 ^M 02	B	2 37	E	10 13	TAU	10
54	23	W.	6 30	D	5 26	B	10 56	2	7	7 1 01	B	3 44	E	9 51	GEM	11
55	24	Th.	6 28	D	5 28	B	11 00	2	8 1/4	8 2 10	B	4 44	E	9 29	GEM	12
56	25	Fr.	6 26	D	5 29	B	11 03	2	9 1/4	9 3 25	B	5 35	E	9 07	CAN	13
57	26	Sa.	6 25	D	5 30	B	11 05	2	10	10 4 43	C	6 19	E	8 44	LEO	14
58	27	B	6 23	D	5 31	B	11 08	2	11 1/2	11 6 00	C	6 55	D	8 22	LEO	15
59	28	M.	6 22	D	5 33	B	11 11	2	11 3/4	— 7 ^P 15	D	7 ^A 26	D	7s.59	LEO	16

FEBRUARY hath 28 days.

1983



This is the time when bit by bit
The days begin to lengthen sweet
And every minute gained is joy —
And love stirs in the heart of a boy
— Katherine Tynan

Farmer's Calendar

After the January thaw comes the February freeze. Both are mythical events, really, or at least they are movable events. The January thaw may take place in December or it may not take place at all, and the February freeze can put a stop to the quickenings of March. A late freeze will come this month in most years, though, and if you're sick of winter this is the one that will break your heart.

The February freeze comes as you realize that the year at last is turning toward spring. You notice that the sun isn't quite a winter sun anymore. It is warm these days, and it makes real shadows, which the sun of December never does. The sun gets into the trees, softening, limbering, awakening buds. At the ends of their gray branches the smallest twigs show softer colors: pink, yellow, green. The trees stretch their arms. The sun gets into the snow and begins to break it down. It gets into the frozen roads. They soften, and to a depth of an inch or so their surfaces turn to mud. The sun gets into you, too. It gets into your heart and tissues and into your thought. It prepares you for spring.

Comes the February freeze. The trees close up like traps. They freeze inside; their branches creak again. The snow that was softening goes as hard and tight as a concrete sidewalk; you can jump up and down on it. The roads that were going to mud freeze solid again, and taking a car on them is like trying to drive a train over the wrong-sized tracks. It's hard, when you had thought winter was ending, to have it all back again. Cheer up. You were right. The sun is warmer. The snow froze and the roads froze, but you didn't freeze. The sun is still preparing you for spring, and soon it will be back at the snowbanks and the ice again. You were right to rejoice.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Tu.	-45°, Pitts- burg, N.H., 1920 • Bar. 30. 09", Portland, Me., 1920 (record high)	<i>Shadows</i>
2	W.	Candlemas • Purif. of Mary • ☾ on Eq. Tides [10.3 10.3	<i>shiver</i>
3	Th.	♂ ♀ ☾ • Four chaplains went down with torpedoed <i>Dorchester</i> , 1943	<i>and</i>
4	Fr.	Patricia Hearst • Charles A. Lind- bergh b. 1902	<i>quiver.</i>
5	Sa.	St. Agatha • "The Furies make their rounds about, about" (Hesiod) [8.3	<i>So</i>
6	B	Sexagesima • ♂ ♀ ☾ • ♂ ♂ ☾	<i>long,</i>
7	M.	☾ stat. • Temperature fell from +40° to -32°F, Hanover, N.H., 1861 [9.0 7.8	<i>sun,</i>
8	Tu.	☾ at ☾ • ♀ Gr. Elong. • Connie Mack d. 1956	<i>you</i>
9	W.	☾ runs 6.5 earthquake, Tides [9.1 low S. California, 1971	<i>gotta</i>
10	Th.	☾ at ☾ • St. Paul ship- wrecked at Malta [9.3 apo. ♂ ♀ ☾ [8.2	<i>run.</i>
11	Fr.	Standing next to the originator of a good sentence is the first quarter of it. [9.5	<i>Damp</i>
12	Sa.	New • Rhapsody in Blue first performed, 1924 Tides [9.7 8.7	<i>and</i>
13	B	Quinquagesima • ♀ stat.	<i>freezing,</i>
14	M.	Valentine's Day • ♂ ♀ ☾ Tides [8.9 9.8	<i>wet</i>
15	Tu.	Shrove Tues. • ♂ ♂ ☾ •	<i>and</i>
16	W.	Ash Wed. • ☾ on Eq. • [9.2 9.6	<i>wheezing.</i>
17	Th.	♂ ♀ ☾ • 61°, Boston, Tides [9.3 Mass., 1981 [9.4	<i>Now, you</i>
18	Fr.	♂ ♀ ☾ • 72°, Providence, Wendell Wilkie R.I., 1981 b. 1892	<i>floozy,</i>
19	Sa.	Reputation is what men think of • <i>this storm's</i> character is what God knows of us.	
20	B	1st S. Lent • Rene Dubos [9.5 d. 1981 [8.5	<i>a doozy!</i>
21	M.	First woman telegrapher, Sarah Bagley, began work. Lowell, Mass., 1846	<i>Finally</i>
22	Tu.	☾ at ☾ • First popcorn eaten • Tides [9.7 by Puritans, 1630 [8.4	<i>clears,</i>
23	W.	☾ runs high Ember, Japanese sub shelled oil refinery, Day Santa Barbara, Cal., 1942	<i>then</i>
24	Th.	-18° F, Valley Head, Winslow Ala., 1905 (record cold) • Homer b. 1836	<i>snow,</i>
25	Fr.	☾ at ☾ • Ember, Enrico Caruso • [10.9 peri. Day b. 1873 [9.6	<i>my dears.</i>
26	Sa.	Ember Navy flier Mason radioed, Day "sighted sub. sank same." 1942	<i>I'm too</i>
27	B	2nd S. Lent • Full Snow • Tides [11.5 Snow [10.5	<i>old to be</i>
28	M.	Comet sighted at noon, northern U.S., 1843 • [11.1 •	<i>this cold.</i>

All things I thought I knew; but now confess
The more I know I know, I know the less.

1983

MARCH, THE THIRD MONTH

Spring begins at 11:39 P.M. on the 20th, the vernal equinox. On that date, the sun rises due east and sets due west; days and nights are of about equal length, with days now getting longer. Venus is now becoming much more prominent in the western, after-sunset sky. To its upper left, you can find the Pleiades, Taurus, Auriga, and Orion, followed by Sirius. High in the southwest are the two prominent twin stars of Gemini, Castor and the slightly brighter Pollux. Left of Gemini is the very dim Cancer, in which lies the fuzzy glow of the Beehive star cluster. The Big Dipper is now beginning to wheel high in the northeast. Three years from this month, Halley's Comet should be at its best in the southeast sky before dawn.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	6th day,	8th hour	17 min.
● New Moon	14th day,	12th hour	45 min.
☾ First Quarter	21st day,	21st hour	27 min.
○ Full Moon	28th day,	14th hour	28 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	Rises h. m.	Key	Sets h. m.	Key	Length of Days h. m.	Sun Fast m.	Full Sea Boston A.M. P.M.	Rises h. m.	Key	Sets h. m.	Key	Declination of sun °	Place	Age
60	1	Tu.	6 20	D	5 34	B	11 14	3	12 12 3	8 ^P _M 27	D	7 ^A _M 55	D	7s. 36	VIR	17
61	2	W.	6 19	D	5 35	B	11 16	3	1 1 4	9 36	E	8 23	C	7 13	VIR	18
62	3	Th.	6 17	D	5 36	B	11 19	3	2 2 1	10 44	E	8 50	B	6 50	VIR	19
63	4	Fr.	6 15	D	5 38	B	11 23	3	2 3 4	11 ^P _M 50	E	9 19	B	6 27	LIB	20
64	5	Sa.	6 14	D	5 39	B	11 25	3	3 3 4	— —	—	9 51	B	6 04	LIB	21
65	6	B	6 12	D	5 40	B	11 28	4	4 4 5	12 ^A _M 52	E	10 27	A	5 41	OPH	22
66	7	M.	6 10	C	5 41	B	11 31	4	5 5 6	1 52	E	11 08	B	5 18	OPH	23
67	8	Tu.	6 09	C	5 42	B	11 33	4	6 6 7	2 46	E	11 ^A _M 54	B	4 55	SAG	24
68	9	W.	6 07	C	5 43	B	11 36	4	7 7 8	3 35	E	12 ^P _M 46	B	4 31	SAG	25
69	10	Th.	6 05	C	5 45	B	11 40	5	8 8 8	4 18	E	1 42	B	4 08	SAG	26
70	11	Fr.	6 04	C	5 46	B	11 42	5	9 9 9	4 55	E	2 41	B	3 44	CAP	27
71	12	Sa.	6 02	C	5 47	B	11 45	5	9 10 10	5 27	E	3 43	B	3 21	CAP	28
72	13	B	6 00	C	5 48	B	11 48	5	10 11 11	5 55	D	4 45	C	2 57	AQU	29
73	14	M.	5 58	C	5 49	B	11 51	6	11 11 11	6 22	D	5 48	D	2 33	AQU	0
74	15	Tu.	5 57	C	5 50	B	11 53	6	11 12 12	— —	—	6 46	D	2 10	PSC	1
75	16	W.	5 55	C	5 52	B	11 57	6	12 12 12	7 10	C	7 56	D	1 46	SET	2
76	17	Th.	5 53	C	5 53	B	12 00	6	12 13 13	7 35	C	9 02	E	1 22	PSC	3
77	18	Fr.	5 52	C	5 54	B	12 02	7	1 1 13	8 03	B	10 11	E	0 58	ARI	4
78	19	Sa.	5 50	C	5 55	C	12 05	7	2 2 13	8 35	B	11 ^P _M 20	E	0 35	TAU	5
79	20	B	5 48	C	5 56	C	12 08	7	2 3 13	9 12	B	— —	—	0s. 11	TAU	6
80	21	M.	5 46	C	5 57	C	12 11	8	3 4 14	9 56	B	12 ^A _M 29	E	0n. 12	TAU	7
81	22	Tu.	5 45	C	5 59	C	12 14	8	4 5 14	10 50	B	1 35	E	0 36	GEM	8
82	23	W.	5 43	C	6 00	C	12 17	8	5 6 14	11 ^A _M 54	B	2 36	E	0 59	GEM	9
83	24	Th.	5 41	C	6 01	C	12 20	9	6 7 14	1 ^P _M 04	B	3 29	E	1 22	CAN	10
84	25	Fr.	5 39	C	6 02	C	12 23	9	8 8 14	2 19	B	4 13	E	1 47	LEO	11
85	26	Sa.	5 38	C	6 03	C	12 25	9	9 9 14	3 35	C	4 51	E	2 10	LEO	12
86	27	B	5 36	B	6 04	C	12 28	9	9 10 14	4 50	D	5 23	D	2 34	LEO	13
87	28	M.	5 34	B	6 05	C	12 31	10	10 11 14	6 03	D	5 52	D	2 57	VIR	14
88	29	Tu.	5 32	B	6 06	C	12 34	10	11 11 14	7 14	D	6 20	C	3 20	VIR	15
89	30	W.	5 31	B	6 08	C	12 37	10	12 12 14	8 24	E	6 48	C	3 44	VIR	16
90	31	Th.	5 29	B	6 09	C	12 40	11	12 13 14	9 ^P _M 32	E	7 ^A _M 16	B	4n. 07	LIB	17

MARCH hath 31 days.

1983



The stormy March is come at last
With wind, and cloud, and changing skies;
I hear the rushing of the blast,
That through the snowy valley flies.

—William Cullen Bryant

Farmer's Calendar

March is like a school play. The fond audience is gathered and expectant; they are eager for the performance to commence. On stage there are sounds of fevered activity, but everything is hidden behind the curtain, which has not yet gone up. The audience must wait a little longer, but they can while away the time by trying to recognize and interpret the bumps, scrapings, and muffled shrieks that issue from behind the curtain, and by watching for a kid to peep out at them.

In March the play we await is the spring, and the signs of its approach, though many, are small and are almost overwhelmed by the remaining evidences of winter. It's as though the scenery and props for spring are being secretly prepared, and all the actors are taking their places under the snow so that when winter finally goes the new season will be set up and ready to begin. You have to look and listen for spring's March preparations, but the signs are there if you do. Some butterflies hibernate, and a warm March sun will bring them out. You'll see them flying sleepily over the snow. Raccoons are out, too. Having slept away the worst of winter, they are abroad these nights. The woods are deep in snow still, but the buds of the beeches are sharp and shiny; the buds of the shagbarks are like great wax flowers. If you listen, in the woods you can hear faint calls and whispers: the brooks are running again beneath the ice.

On the hillsides and on banks beside the roads where the sun hits, there are dark patches on the snow. That's dirt, earth. You don't recognize it at first because it's been four or five months since you have seen bare ground in any quantity. There it is, though, one of the young company of spring peeping out at you from the other side of the curtain like that kid at the play.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Tu.	St. David • ☾ on Eq. • Vt. Town Meeting [10.7 First issue of <i>Time</i> , 1923 • Blackthorn winds blow. Tides [11.2	<i>There's no</i>
2	W.		
3	Th.	• ☽ ☾ • Settlement of Maryland, 1634 • risk [10.7	
4	Fr.	Snow pellets, Oahu, Hawaii, 1953 • Jefferson inaugurated, 1804 [10.2 • ☽ ☾ • FDR declared "bank holiday," 1933 [9.3	<i>is</i>
5	Sa.		<i>saying</i>
6	B	3rd S. Lent • 16 tornadoes, Ill. and Ind., 1961 • it's [8.6	
7	M.	☾ at ☽ • Necessity makes strange bed-fellows. Tides [8.9	<i>brisk.</i>
8	Tu.	Hundreds of thousands of passenger pigeons flew over New England, 1630 • [8.7	<i>Now</i>
9	W.	☾ runs • ☾ at Ford Motor Co. built first V-8, 1932 • much [7.6	
10	Th.	Bix Beiderbecke • Snow total 21½, Colebrook, N.H., 1971 • wetter	
11	Fr.	Blizzard of '88 began, East Coast • passed, 1941 • and	
12	Sa.	St. Gregory • First " Fireside Chat" by FDR, 1933 [9.3	<i>feeling</i>
13	B	4th S. Lent • Ear-muffs patented, 1877 [8.6	<i>better.</i>
14	M.	New • ☽ stat. • Tides [9.8	<i>Cold</i>
15	Tu.	☾ on Eq. • Men and pyramids are not made to stand on their heads. • again, [9.3	
16	W.	• ☽ ☾ • Robert Goddard launched first liquid-fueled rocket, 1926 • snow	
17	Th.	St. Patrick • ☽ ☾ • up north —	
18	Fr.	Clipper ship <i>Surprise</i> sailed N.Y.-Frisco in 96 days 15 hours, 1851 • Tides [9.9	<i>not</i>
19	Sa.	William Jennings • Wyatt Earp • Earl Warren b. 1891 • a time [9.5	
20	B	5th S. Lent • Passion • Equinox 11:39 P.M. to [9.7	<i>to</i>
21	M.	☾ at ☽ • J.S. Bach b. 1685 • Tides [8.6	<i>sally</i>
22	Tu.	Below freezing for 161 consecutive days, Muscatine, Iowa, 1872 • Tides [9.7	<i>forth.</i>
23	W.	☾ runs • On a calm sea, every high one is a pilot. • [8.5	<i>Oh, thou</i>
24	Th.	Construction of N.Y. subway system began, 1900 • Tides [9.9	<i>Winter,</i>
25	Fr.	Annunciation • ☾ at peri. d. 1973 • Edward Steichen go away! [8.8	
26	Sa.	♀ sup. • Mideast Peace conj. Treaty signed, 1979 • Tides [10.6	<i>We're</i>
27	B	Palm Sun. • 2 stat. • Tides [10.9	<i>sick</i>
28	M.	☾ on Eq. • Full Worm • Tides [11.0	<i>of you —</i>
29	Tu.	Passover • Man-O'-War b. 1917 • too [10.8	
30	W.	• ☽ ☾ • Pencil with eraser patented, 1858 • Tides [10.9	<i>cold</i>
31	Th.	<i>Oklahoma</i> opened, N.Y.C., 1943 • Jesse Owens d. 1980 • to play.	

1983

APRIL, THE FOURTH MONTH

Mercury puts in its best evening appearance of the year, shining low in the western sky as dark falls. Look for it especially around the time it is farthest east of the sun — 20 degrees — on the 21st. Saturn is also at its best on the 21st, when it reaches opposition and is therefore visible all night. It follows the slightly fainter star Spica up into the southeast in the early evening. Jupiter, far brighter, rises somewhat later than Saturn. High in the north is the Big Dipper, pouring out its imaginary contents. A line through the outer stars of the Big Dipper's bowl directs the gaze to Polaris, the North Star. Extend the arc of its handle outward to find orange Arcturus, brightest spring star, in the northeast. High in the south, majestic Leo the Lion features the star Regulus, which marks his heart.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	5th day,	3rd hour	40 min.
● New Moon	13th day,	2nd hour	59 min.
☾ First Quarter	20th day,	3rd hour	58 min.
○ Full Moon	27th day,	1st hour	32 min.

ADD 1 hr. for Daylight Saving Time at 2 A.M. Apr. 24.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☼ Rises h. m.	Key	☼ Sets h. m.	Key	Length of Days h. m.	Sun Fast m.	Full Sea Boston A.M. P.M.	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declination of sun °	☾ Place	☾ Age
91	1	Fr.	5 27	B	6 10	C	12 43	11	1 1/2	2 10P38	E	7A46	B	4N.30	LIB	18
92	2	Sa.	5 26	B	6 11	C	12 45	11	2 1/4	2 11P40	E	8 21	B	4 53	OPH	19
93	3	B	5 24	B	6 12	C	12 48	12	3 3/4	— —	—	9 01	A	5 16	OPH	20
94	4	M.	5 22	B	6 13	D	12 51	12	3 3/4	12M38	E	9 46	A	5 39	SAG	21
95	5	Tu.	5 20	B	6 14	D	12 54	12	4 5/8	1 30	E	10 36	B	6 02	SAG	22
96	6	W.	5 19	B	6 15	D	12 56	12	5 6/8	2 16	E	11M31	B	6 25	SAG	23
97	7	Th.	5 17	B	6 17	D	13 00	13	6 3/4	2 55	E	12M29	B	6 47	CAP	24
98	8	Fr.	5 15	B	6 18	D	13 03	13	7 1/4	3 28	E	1 30	B	7 10	CAP	25
99	9	Sa.	5 14	B	6 19	D	13 05	13	8 1/4	3 58	E	2 32	C	7 32	AQU	26
100	10	B	5 12	B	6 20	D	13 08	14	9 1/4	4 25	D	3 35	C	7 54	AQU	27
101	11	M.	5 10	B	6 21	D	13 11	14	10 1/4	4 49	D	4 39	D	8 17	PSC	28
102	12	Tu.	5 09	B	6 22	D	13 13	14	10 1/2	5 13	D	5 44	D	8 38	CET	29
103	13	W.	5 07	B	6 23	D	13 16	14	11 1/4	5 38	C	6 51	E	9 00	PSC	0
104	14	Th.	5 05	B	6 24	D	13 19	15	— 12	6 06	B	8 00	E	9 22	CET	1
105	15	Fr.	5 04	B	6 26	D	13 22	15	12 3/4	6 35	B	9 10	E	9 43	ARI	2
106	16	Sa.	5 02	B	6 27	D	13 25	15	1 1/2	7 11	B	10 21	E	10 05	TAU	3
107	17	B	5 01	B	6 28	D	13 27	15	1 3/4	7 54	B	11P30	E	10 26	TAU	4
108	18	M.	4 59	B	6 29	D	13 30	16	2 1/4	8 45	B	— —	—	10 47	GEM	5
109	19	Tu.	4 57	B	6 30	D	13 33	16	3 1/4	9 45	B	12M33	E	11 08	GEM	6
110	20	W.	4 56	B	6 31	D	13 35	16	4 1/4	10M52	B	1 27	E	11 29	CAN	7
111	21	Th.	4 54	B	6 32	D	13 38	16	5 1/4	12M05	B	2 13	E	11 49	CAN	8
112	22	Fr.	4 53	B	6 33	D	13 40	16	6 1/4	1 19	C	2 52	E	12 10	LEO	9
113	23	Sa.	4 51	B	6 35	D	13 44	17	7 1/4	2 32	C	3 25	D	12 30	LEO	10
114	24	B	4 50	B	6 36	D	13 46	17	8 1/4	3 44	D	3 53	D	12 50	VIR	11
115	25	M.	4 48	B	6 37	D	13 49	17	9 1/4	4 54	D	4 20	C	13 10	VIR	12
116	26	Tu.	4 47	B	6 38	D	13 51	17	10 1/4	6 04	E	4 47	C	13 29	VIR	13
117	27	W.	4 45	B	6 39	D	13 54	17	11 1/4	7 13	E	5 15	B	13 48	VIR	14
118	28	Th.	4 44	B	6 40	D	13 56	17	— 12	8 21	E	5 44	B	14 07	LIB	15
119	29	Fr.	4 43	B	6 41	D	13 58	18	12 1/4	9 26	E	6 16	B	14 26	SCO	16
120	30	Sa.	4 41	B	6 42	D	14 01	18	1 1/2	10P27	E	6M54	B	14N.44	OPH	17

APRIL hath 30 days.

1983



Ah, spring was sent for lass and lad,
 'Tis now the blood runs gold,
 And man and maid had best be glad
 Before the world is old.

— A.E. Houseman

Farmer's Calendar

How do the meadows green? By the end of April the lank brown fields, flattened and bleached by the winter snow, have been overtaken by strong spring green. If you watch over a particular meadow during this month, you will find the increase of green is a process you can notice, but one you can't measure or observe. In the same way, you can't observe the aging of familiar faces, including your own, though you can see it plainly at certain times. In April, youth and renewal surprise a meadow by a kind of reversal of the same elusive process as that by which our age surprises us. It's another instance in which, to a certain eye, nature goes up and down, forward and back, by the same steps.

The meadows green by a slow suffusion. Lowland meadows turn to green before upland; and everywhere short grass greens earliest. By mid-April clipped lawns and borders show a deep summer green, while mowings and open fields are still in late winter's pale straw. In them the green comes up from under. Some meadows green irregularly, in patches and points. For a day or so an April meadow may take on the look of a map with continents, peninsulas, and islands of green in oceans of brown. Some meadows green late. I drive by one big hillside that shows its open, curved top to the southwest and never seems to wake at all much before May Day. Each meadow has its own plan, its own clock.

As a meadow quickens there will be an hour when the quantity of new green just balances winter's browns and grays. Then the spring's green will seem to light the old meadow from below, making it momentarily luminous. This lasts for a day or less. A gentle rain will come to aid the new grass, and the next day the meadow will be entirely green.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	Fr.	Good Fri. • ♀ stat • Tides [10.6 9.6	April
2	Sa.	♂ ♂ ♀ • 16% of all tornadoes occur this month. • [10.2 9.0	showers,
3	B	Easter • (at ♀ • ♂ ♀ ♀ •	cool and
4	M.	St. Ambrose French and Indian raid on Charlestown, N.H., 1747	pouring —
5	Tu.	♂ runs low • Private gold stores • Plato b. called in, 1933 • 428 B.C.	• keep
6	W.	♂ at apo. • Blizzard, NY-New England, 30" snow Nelson, N.H., 1982 • [8.5 7.7	it
7	Th.	Dag Hammarskjöld elected Secretary-General of U.N., 1953 • Tides [8.5 7.8	up,
8	Fr.	85° New York • Pablo Picasso • Tides [8.6 8.1	it's
9	Sa.	City, 1929 • Bataan fell to Japanese troops, 1942 • [8.5 8.1	getting
10	B	Low Sun. • 60 killed in Wichita Falls, Tex. tornado, 1979	horing.
11	M.	Rock Island bridge completed over Mississippi River, Ill.-Iowa, 1856 •	Glówery,
12	Tu.	♂ on • 231-mph winds, Mt. Eq Washington, N.H., 1934 • Tides [9.7 9.9	cool,
13	W.	New • Thomas Jefferson • Easter Blizzard, b. 1743 • Dakotas-Kansas, 1873	rain
14	Th.	♂ ♀ ♀ • Space shuttle Columbia landed Edwards A.F.B., Calif., 1981 • on,	
15	Fr.	The good man can't be bribed — He is good for nothing • [10.8 9.5	you fool!
16	Sa.	♂ ♀ ♀ • Liberty Bell rung for peace with England, 1783 • [10.6 9.6	Now so
17	B	2nd S. af. E. • (at ♂ •	heavy
18	M.	♂ at ♀ • First "Washteria" (laundromat) opened, Fort Worth, Tex., 1934 • [10.4 9.0	you'll
19	Tu.	♂ runs high • Patriots Day, Massachusetts • Tides [10.2 8.8	drown
20	W.	Carnegie gave \$1.5 million to build The Hague Peace Palace, 1903 •	your Chevy.
21	Th.	♂ at peri. • ♀ Gr. Elong. E. (20°) • ♀ at ♂ • Queen Eliza- beth II b. 1926	—
22	Fr.	♂ ♀ Aldeb. • Earth Day, 1970 • Tides [9.8 9.2	It's
23	Sa.	St. George First circumnavigation of Dead Sea, 1848 • [10.0 9.7	so
24	B	3rd S. af. E. • Alewives migrate, Cape Cod • soggy	
25	M.	St. Mark • (at ♂ • Plant seeds Eq today. • Tides [10.3 10.6	we're
26	Tu.	♂ h ♂ • John Wilkes Booth shot, 1865 • Tides [10.3 10.8	groggy.
27	W.	Full ♀ • Life is like the moon; Pink Now dark, now full. • Tides [10.2 10.9	Nicer
28	Th.	Coxey's Army marched on Washington, D.C., 1894 • Maryland became 7th state, 1788	out,
29	Fr.	♂ ♂ ♀ • Zipper patented, 1913 • Tides [10.7 9.6	no
30	Sa.	(at ♀ • Moscow founded, 1156 • Casey Jones killed, 1900	doubt.

Nobody ever forgets where
 he buried a hatchet.

1983

MAY, THE FIFTH MONTH

The planet Jupiter is the brilliant object in the east as darkness falls on May evenings this year. Only Venus, high and radiant in the west, outshines it, but Venus sets a few hours after sundown. Jupiter is visible all night in Scorpius, coming to opposition on the 27th. Uranus is at opposition on the evening of the 28th and on the 16th is less than 1 degree south of Jupiter. Uranus, over 1½ billion miles away, can be glimpsed with the naked eye under good conditions. Leo slopes towards the west, Arcturus is brilliant in the south, and below it the star Spica marks the ear of wheat held by Virgo the Virgin. Still lower is the conspicuous little Corvus the Crow, and following Spica is planet Saturn.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	4th day,	22nd hour	44 min.
● New Moon	12th day,	14th hour	26 min.
☾ First Quarter	19th day,	9th hour	18 min.
○ Full Moon	26th day,	13th hour	48 min.

ADD 1 hr. for Daylight Saving Time.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☺ Rises h. m.	Key	☺ Sets h. m.	Key	Length of Days h. m.	Sun Fast	Full Sea Boston m. A.M. P.M.	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declina- tion of sun °	Place	Age
121	1	B	4 40	B	6 44	D	14 04	18	1 3 2 4	11 ^P 23	E	7 ^A 37	A	15 ^N 02	SAG	18
122	2	M.	4 39	B	6 45	D	14 06	18	2 3	—	—	8 25	A	15 20	SAG	19
123	3	Tu.	4 37	B	6 46	D	14 09	18	3 4	12 ^A 11	E	9 19	A	15 38	SAG	20
124	4	W.	4 36	B	6 47	D	14 11	18	4 4	12 53	E	10 17	B	15 56	CAP	21
125	5	Th.	4 35	B	6 48	D	14 13	18	5 5	1 29	E	11 ^A 16	B	16 14	CAP	22
126	6	Fr.	4 33	B	6 49	D	14 16	18	6 6	1 59	E	12 ^P 18	B	16 31	AQU	23
127	7	Sa.	4 32	B	6 50	D	14 18	18	7 7	2 26	D	1 20	C	16 47	AQU	24
128	8	B	4 31	B	6 51	D	14 20	19	7 3	8	D	2 23	C	17 04	AQU	25
129	9	M.	4 30	B	6 52	D	14 22	19	8 9	3 15	D	3 27	D	17 20	PSC	26
130	10	Tu.	4 29	A	6 53	D	14 24	19	9 9	3 40	C	4 33	D	17 36	CET	27
131	11	W.	4 27	A	6 54	D	14 27	19	10 10	4 06	C	5 43	E	17 51	PSC	28
132	12	Th.	4 26	A	6 55	D	14 29	19	10 3	4 34	B	6 54	E	18 06	ARI	0
133	13	Fr.	4 25	A	6 57	D	14 32	19	11 11	5 08	B	8 07	E	18 21	TAU	1
134	14	Sa.	4 24	A	6 58	D	14 34	19	—	5 49	B	9 18	E	18 36	TAU	2
135	15	B	4 23	A	6 59	D	14 36	19	12 1	6 37	B	10 26	E	18 50	TAU	3
136	16	M.	4 22	A	7 00	D	14 38	19	1 2	7 36	B	11 ^P 25	E	19 04	GEM	4
137	17	Tu.	4 21	A	7 01	D	14 40	19	2 3	8 43	B	—	—	19 18	GEM	5
138	18	W.	4 20	A	7 02	E	14 42	19	3 4	9 55	B	12 ^A 14	E	19 32	CAN	6
139	19	Th.	4 19	A	7 03	E	14 44	19	4 5	11 ^A 09	B	12 54	E	19 45	LEO	7
140	20	Fr.	4 18	A	7 04	E	14 46	19	5 6	12 ^P 22	C	1 28	D	19 57	LEO	8
141	21	Sa.	4 17	A	7 05	E	14 48	18	6 7	1 33	D	1 58	D	20 10	VIR	9
142	22	B	4 17	A	7 06	E	14 49	18	7 8	2 42	D	2 25	D	20 22	VIR	10
143	23	M.	4 16	A	7 07	E	14 51	18	8 8	3 51	D	2 50	C	20 33	VIR	11
144	24	Tu.	4 15	A	7 07	E	14 52	18	9 9	4 59	E	3 16	B	20 44	VIR	12
145	25	W.	4 14	A	7 08	E	14 54	18	10 10	6 06	E	3 44	B	20 55	LIB	13
146	26	Th.	4 14	A	7 09	E	14 55	18	11 11	7 12	E	4 14	B	21 06	LIB	14
147	27	Fr.	4 13	A	7 10	E	14 57	18	11 3	8 15	E	4 50	B	21 17	OPH	15
148	28	Sa.	4 12	A	7 11	E	14 59	18	—	9 13	E	5 30	A	21 27	OPH	16
149	29	B	4 12	A	7 12	E	15 00	18	12 1	10 05	E	6 17	A	21 36	SAG	17
150	30	M.	4 11	A	7 13	E	15 02	18	1 2	10 49	E	7 09	A	21 45	SAG	18
151	31	Tu.	4 11	A	7 13	E	15 02	17	2 2	11 ^P 27	E	8 ^A 05	B	21 ^N 54	CAP	19

MAY hath 31 days.

1983



Now the bright morning-star, day's harbinger,
Comes dancing from the east, and leads with her
The flowery May, who from her green lap throws
The yellow cowslip and the pale primrose.

— John Milton

Farmer's Calendar

May is the big yellow butterflies' time. They are tiger swallowtails, black-barred yellow. As big as a boy's hand, they are about the largest butterfly that northern New England has. They turn up around the middle of the month in my neighborhood, and for some weeks they are everywhere. They are about the meadows and gardens, but they also love the woods, and it seems that every step you take there will start up another one to fly before you among the rays of sunlight that get in between the trees. The butterflies frequent the roadsides, too, and there thousands of them come to grief, done in by cars. You can find their bright wings decorating your radiator when you return from a drive. In a good swallowtail year you can hardly look out at the world from any quarter without seeing one of these butterflies passing in lazy flight. By July enough of them will have been snapped up by birds, killed by misfortunes of one kind or another, and inhaled by cars so that they won't appear as common. Now, however, the big yellow butterflies dominate the lengthening May days like yellow-winged summer thoughts.

The tiger swallowtail comes from a caterpillar, a green thing about an inch long with a humped back and a pair of yellow popeyes that aren't really eyes at all (they'd be on its shoulders, if caterpillars had shoulders). Even among caterpillars this one is nothing special; it's unassuming and unlovely, and it doesn't do any of those little tricks that distinguish some other caterpillars. And yet from this unpromising material will come a creature splendid, famed, and powerful in its way. It's that contrast that prompts the last of the sage's Seven Questions. Asked of the caterpillar, that question is: *Does it know?*

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	B	4 th S. af. E. Sts. Philip and James	♂ ♀ ☁ Showers
2	M.	☾ runs low • Stonewall Jackson • Leonardo da Vinci d. 1863	1519 and
3	Tu.	Invention of Cross • 11.6' rain in 8 hrs., New Orleans, La., 1978	[9.2] flowers
4	W.	☾ at apo. • Audrey Hepburn b. 1929	[8.1] passeth
5	Th.	Pear blossoms, Norwalk, Conn., 1922 • 12" snow, Denver, Colo., 1917	[8.6] the
6	Fr.	♂ ♀ Antares Dutch bought Manhattan for \$24 in trinkets, 1626	[8.5] hours.
7	Sa.	Kentucky Derby Day • Johannes Brahms b. 1833	[8.6] Now
8	B	Rogation S. First unassisted triple play, 1878	[8.8] wet,
9	M.	☾ on Eq. • Latest opening of Lake Erie navigation, Buffalo, N.Y., 1926	[8.4] you bet.
10	Tu.	Red Sox won 15th straight game, 1946 • Joan Crawford d. 1977	[9.3] Dark
11	W.	Three • Remorse is the echo of a lost virtue.	[9.9] and
12	Th.	Ascension • Chilly • New Saints • A smart fly never lights on a boiling pot.	[9.5] moist —
13	Fr.	Britain ended 31-year rule in Palestine, Israel independent, 1948	[11.0] it could
14	Sa.	1 st S. af. Ascen. (Cat ☾ • ☾ ♀ ☾ Ah, the	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [11.0] sun!
15	B	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
16	M.	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
17	Tu.	24" rain in 11 hours, severe flooding of Pearl River, S. China, 1982	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
18	W.	Shebuoth Grant began siege of Vicksburg, Miss., 1863	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
19	Th.	St. Dunstan • Robert B. Thomas d., W. Boylston, Mass., 1846	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
20	Fr.	N.Y. Yankees in last place, 1959 • Earthquake killed 250,000, Antioch, Syria, A.D., 526	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
21	Sa.	Washington, D.C., tornado, 1943 • Thomas "Fats" Waller b. 1904	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
22	B	Whit Sun • Pentecost • Elbow grease makes wealth increase.	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
23	M.	☾ ♀ ☾ ☾ • 6" snow in Kentucky, 1894	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
24	Tu.	☾ ♀ ☾ ☾ • Babe Ruth hit last (#714) home run, 1935	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
25	W.	Ember Day • Samuel Pepys d. 1703	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
26	Th.	Full Flower • ☾ ☾ ☾ ☾ • ☾ ☾ ☾ ☾	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
27	Fr.	St. Bede • ☾ ☾ ☾ ☾ • ☾ ☾ ☾ ☾	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
28	Sa.	☾ ☾ ☾ ☾ • ☾ ☾ ☾ ☾ • ☾ ☾ ☾ ☾	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
29	B	Trinity • Wisconsin became 30th state, 1848	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
30	M.	Memorial Day • ☾ runs low • ☾ ☾ ☾ ☾	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!
31	T.	☾ ♀ ☾ ☾ ☾ • Sea battle of Jutland, 1916	☾ runs at high • ☾ peri. • ☾ ♀ ☾ Tides [9.5] sun!

1983

JUNE, THE SIXTH MONTH

The year's shortest nights around the summer solstice (June 21, at 6:09 P.M.) hold much to see. On the 16th, Venus is farthest east of the sun (45 degrees) and brightening rapidly. Mercury, at its greatest elongation west of the sun (24 degrees) on the 8th, is hidden by the moon in the dawn sky on the 9th, making it this year's only occultation of a bright star or planet by the moon visible from the United States. Saturn is in Virgo, followed by dim Libra and bright Scorpius. Jupiter is near Beta of Scorpius on the 22nd, not far ahead of Antares. High in the south, Arcturus, Corona Borealis, and Hercules are followed by the rising Milky Way and the bright triangle of Vega, Deneb, and Altair. A partial eclipse of the moon begins its penumbral phase at 12:43 A.M. on the 25th, ending 6:01 A.M., EST.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	3rd day,	16th hour	8 min.
● New Moon	10th day,	23rd hour	38 min.
☾ First Quarter	17th day,	14th hour	47 min.
○ Full Moon	25th day,	3rd hour	33 min.

ADD 1 hr. for Daylight Saving Time.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☼ Rises h. m.	☼ Sets h. m.	☼ Key	Length of Days h. m.	Sun Past m.	Full Sea Boston A.M. P.M.	☾ Rises h. m.	☾ Key	☾ Sets h. m.	☾ Key	Declination of sun °	☾ Place	☾ Age
152	1	W.	4 10	A 7 14	E	15 04	17	23 31	— —	—	9 ^M 04	B	22N.02	CAP	20
153	2	Th.	4 10	A 7 15	E	15 05	17	3 4	12 ^M 00	E	10 05	B	22 10	CAP	21
154	3	Fr.	4 09	A 7 16	E	15 07	17	4 5	12 28	E	11 ^M 06	C	22 17	AQU	22
155	4	Sa.	4 09	A 7 16	E	15 07	17	5 5	12 54	D	12 ^M 07	C	22 24	AQU	23
156	5	B	4 08	A 7 17	E	15 09	17	6 6	1 17	D	1 10	D	22 31	PSC	24
157	6	M.	4 08	A 7 18	E	15 10	16	7 7	1 41	C	2 15	D	22 38	CET	25
158	7	Tu.	4 08	A 7 18	E	15 10	16	7 8	2 05	C	3 21	E	22 44	PSC	26
159	8	W.	4 08	A 7 19	E	15 11	16	8 9	2 33	B	4 31	E	22 50	CET	27
160	9	Th.	4 07	A 7 20	E	15 13	16	9 9	3 04	B	5 44	E	22 55	TAU	28
161	10	Fr.	4 07	A 7 20	E	15 13	16	10 10	3 41	B	6 58	E	23 00	TAU	0
162	11	Sa.	4 07	A 7 21	E	15 14	16	11 11	4 27	B	8 10	E	25 04	TAU	1
163	12	B	4 07	A 7 21	E	15 14	15	12	5 23	A	9 14	E	23 08	GEM	2
164	13	M.	4 07	A 7 22	E	15 15	15	12 1	6 28	B	10 09	E	23 12	GEM	3
165	14	Tu.	4 07	A 7 22	E	15 15	15	1 1	7 41	B	10 54	E	23 15	CAN	4
166	15	W.	4 07	A 7 23	E	15 16	15	2 2	8 56	B	11 ^M 31	E	23 18	LEO	5
167	16	Th.	4 07	A 7 23	E	15 16	14	3 3	10 11	C	— —	—	23 20	LEO	6
168	17	Fr.	4 07	A 7 23	E	15 16	14	4 4	11 ^M 24	D	12 ^M 02	D	23 22	LEO	7
169	18	Sa.	4 07	A 7 24	E	15 17	14	5 5	12 ^M 34	D	12 30	D	23 24	VIR	8
170	19	B	4 07	A 7 24	E	15 17	14	6 6	1 43	D	12 55	C	23 25	VIR	9
171	20	M.	4 07	A 7 24	E	15 17	14	7 7	2 50	E	1 21	B	23 26	VIR	10
172	21	Tu.	4 07	A 7 24	E	15 17	13	8 8	3 56	E	1 48	B	23 26	LJB	11
173	22	W.	4 08	A 7 25	E	15 17	13	9 9	5 02	E	2 17	B	23 26	LIB	12
174	23	Th.	4 08	A 7 25	E	15 17	13	9 10	6 05	E	2 50	B	23 26	OPH	13
175	24	Fr.	4 08	A 7 25	E	15 17	13	10 10	7 05	E	3 28	A	23 25	OPH	14
176	25	Sa.	4 08	A 7 25	E	15 17	13	11 11	7 59	E	4 12	A	23 23	SAG	15
177	26	B	4 09	A 7 25	E	15 16	12	— 12	8 46	E	5 02	A	23 21	SAG	16
178	27	M.	4 09	A 7 25	E	15 16	12	12 12	9 27	E	5 56	B	23 19	SAG	17
179	28	Tu.	4 10	A 7 25	E	15 15	12	12 1	10 01	E	6 54	B	23 16	CAP	18
180	29	W.	4 10	A 7 25	E	15 15	12	1 2	10 31	E	7 55	B	23 13	CAP	19
181	30	Th.	4 10	A 7 25	E	15 15	12	2 2	10 ^M 57	D	8 ^M 55	B	23N.10	AQU	20

JUNE hath 30 days.

1983



Rainbows; and the blue bitter smoke of wood;
And radiant raindrops crouching in cool flowers;
And flowers themselves that sway through sunny hours,
Dreaming of moths that drink them under the moon.

— Rupert Brooke

Farmer's Calendar

Flea markets are open for business about this time of year: the unimportant stuff of others' lives is on display for us all. I have always found fun and encouragement in flea markets, and it's evident that others find the same. I think the appeal of flea markets is to those who don't quite buy the idea of progress, those who persist in believing, even if they know better, that the old days — including fairly recent old days — were better days than our own. Flea markets allow these sentimental individuals to see, handle, enjoy, and even possess articles from the past, and so to partake in that past. The wealth of bent scythes, busted harness, rusty pails, anvils, liniment bottles, potato mashers, cracker tins, and the rest confirm a time when life was a bit tougher, but, some think, easier, too. When we commune with these articles at a flea market, we participate in that time through its humble appurtenances.

Flea market customers accept the genial fiction that because flea market items are for sale, they must have some value. Flea market vendors, if they know better, don't dissent. There is an old story — perhaps apocryphal — of a Vermont flea market seller who died and went to hell. In punishment for his having presumed to charge real money for the junk he had sold every summer weekend for 30 years, the seller was condemned to pay ghostly visits to houses all across the land, retrieving the thousands of articles he had sold, and refunding their prices. A collector in Akron wondered who could have entered his house by night and taken one Prince Albert tobacco can and left \$2. The phantom flea marketer is still at large. Let other sellers ponder this tale as they spread their innocent wares on tables under June's warm sun.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	W.	☾ at apo. • Liberty Bell rung when Kentucky became 15th state, 1792 • <i>In for</i>	
2	Th.	American Indians granted • First night baseball game, citizenship, 1924 • Ft. Wayne, Ind., 1883 • <i>a</i>	
3	Fr.	♂ ♂ ☉ Dunkirk evacuation • [8.8] <i>drenching</i> — completed, 1940 • [8.3]	
4	Sa.	Kermit Roosevelt d. 1943 • Gordy Howe retired, 1980 • Tides [8.6] <i>mighty</i>	
5	B	2 nd S. af. P. • St. Boniface • <i>thirst-</i>	
6	M.	☾ on Eq. • Andrew Jackson first Pres. to ride railroad, 1833 • <i>quenching!</i>	
7	Tu.	Bachelors' wives and spinsters' children are well-behaved. • Tides [8.8] <i>Hot</i>	
8	W.	♀ Gr. Elong. • Leroy "Sachel" • Tides [9.0] <i>and</i> W. (24") • Paige d. 1982 • [10.2]	
9	Th.	Occult. of ♀ by ☾ • 90 killed in Worcester, Mass., tornado, 1953 • <i>showery</i>	
10	Fr.	New • Eclipse ☉ • Edward Everett • [9.5] <i>for</i> Hale d. 1909 • [11.1]	
11	Sa.	St. Barnabas • ☾ at ☿ • 11" snow, Berlin, N.H., 1842 • <i>your</i>	
12	B	3 rd S. af. P. • ☾ runs high • <i>dowry.</i>	
13	M.	☾ at peri. • Fabricius discovered sunspots, 1611 • Tides [11.5] <i>Rain</i>	
14	Tu.	♀ ♀ ☾ Argentina surrendered Falkland Is. to Britain, 1982 • <i>and cool</i>	
15	W.	Edward Grieg • Franklin's kite experiment, 1752 • [11.1] <i>and out</i>	
16	Th.	♀ Gr. Elong. • Russia launched first female astronaut, 1863 • [9.8] <i>of school.</i>	
17	Fr.	Eclipse of ☉ • Steamer Griffith burned sun, 1433 • on Lake Erie, 300 d., 1850 • <i>Just the</i>	
18	Sa.	☾ on Eq. • Don't brew beer when beans are in blossom. • Tides [9.9] <i>tune</i>	
19	B	4 th S. af. P. • ☾ at ☿ • ☾ h ☾ for	
20	M.	Once a woman has given you her heart you can never get rid of the rest of her. • [9.2] <i>the</i>	
21	Tu.	Solstice • Midsummer's • 90°, Nantucket, Mass., 1923 • <i>month</i>	
22	W.	11:09 P.M. Day • 118", Bullhead City, Ariz., 1981 • Tides [9.0] <i>of</i>	
23	Th.	Rain tomorrow means a wet harvest. • Taft Hartley Act, 1947 • [10.3] <i>June.</i>	
24	Fr.	Nativity of John the Baptist • ☾ at ☿ • ☾ ♀ ☾ • <i>Cooling,</i>	
25	Sa.	Full Strawberry • Eclipse ☉ • Tides [8.8] <i>drooling.</i>	
26	B	5 th S. af. P. • ☾ runs low • Yes, it's damp.	
27	M.	Little wit in the head makes much work for the feet. • Tides [10.0] <i>Time</i>	
28	Tu.	☾ at apo. • Jean Jacques Rousseau b. 1712 • Tides [9.9] <i>to go</i>	
29	W.	St. Peter • Cruelty to Animals Act passed, 1906 • Tides [9.7] <i>off to</i>	
30	Th.	Yosemite opened as public park, 1864 • Gone with the Wind published, 1936 • <i>camp.</i>	

Money is like manure: unless you spread it around, it doesn't do much good.

1983

JULY, THE SEVENTH MONTH

On sultry July twilights, Hercules is overhead with its fine telescopic cluster M13 (just visible to the naked eye). While Arcturus goes down the sky's west slope, Vega approaches the summit from the east. This blue star is in tiny, perfect Lyra the Lyre. It forms the summer triangle with Deneb in grand Cygnus the Swan and with Altair in Aquila the Eagle. But the most spectacular sight of the month is the lantern of Venus in the after-sunset sky. This dazzling queen reaches greatest brilliancy on the 19th and has a superb conjunction with the star Regulus on the 9th, when it is less than 0.7 degrees south. Mercury's 0.4 degree conjunction with Regulus on the 31st is much closer to the sun and much more difficult to observe.

ASTRONOMICAL CALCULATIONS

☾ Last Quarter	3rd day,	7th hour	13 min.
● New Moon	10th day,	7th hour	19 min.
☾ First Quarter	16th day,	21st hour	52 min.
○ Full Moon	24th day,	18th hour	28 min.

ADD 1 hr. for Daylight Saving Time.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☺ Rises h. m.	Key	☺ Sets h. m.	Key	Length of Days h. m.	Sun Fast m.	Full Sea Boston A.M. P.M.	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declination of sun °	☾ Place	☾ Age	
182	1	Fr.	4 11	A	7 25	E	15 14	11	3	3 12	11 ^P 21	D	9 ^A 56	C	23N.07	AQU	21
183	2	Sa.	4 11	A	7 25	E	15 14	11	3	4 12	11 ^P 44	C	10 ^A 57	C	23 02	PSC	22
184	3	B	4 12	A	7 24	E	15 12	11	4	5	—	—	12 ^P 00	D	22 58	CET	23
185	4	M.	4 13	A	7 24	E	15 11	11	5	6	12 ^A 07	C	1 04	D	22 53	CET	24
186	5	Tu.	4 13	A	7 24	E	15 11	11	6	6 33	12 31	B	2 11	E	22 47	CET	25
187	6	W.	4 14	A	7 24	E	15 10	10	7	7 33	1 00	B	3 20	E	22 41	ARI	26
188	7	Th.	4 14	A	7 23	E	15 09	10	8	8 33	1 33	B	4 33	E	22 35	TAU	27
189	8	Fr.	4 15	A	7 23	E	15 08	10	9	9 33	2 14	B	5 46	E	22 29	TAU	28
190	9	Sa.	4 16	A	7 23	E	15 07	10	10	10 33	3 05	B	6 55	E	22 22	GEM	29
191	10	B	4 16	A	7 22	E	15 06	10	10	11	4 07	B	7 55	E	22 15	GEM	0
192	11	M.	4 17	A	7 22	E	15 05	10	11	—	5 18	B	8 46	E	22 07	CAN	1
193	12	Tu.	4 18	A	7 21	E	15 03	9	12	12 12	6 36	B	9 28	E	21 59	CAN	2
194	13	W.	4 19	A	7 21	E	15 02	9	12	1 12	7 54	C	10 03	D	21 50	LEO	3
195	14	Th.	4 20	A	7 20	E	15 00	9	1	2 12	9 10	C	10 32	D	21 41	LEO	4
196	15	Fr.	4 20	A	7 19	E	14 59	9	2	3 12	10 23	D	10 59	C	21 32	VIR	5
197	16	Sa.	4 21	A	7 19	E	14 58	9	3	4 12	11 ^A 33	D	11 25	B	21 22	VIR	6
198	17	B	4 22	A	7 18	E	14 56	9	4	5 12	12 ^P 42	E	11 ^P 52	B	21 12	VIR	7
199	18	M.	4 23	A	7 17	E	14 54	9	5	6 12	1 49	E	—	—	21 02	LIB	8
200	19	Tu.	4 24	A	7 17	E	14 53	9	6	7 12	2 55	E	12 ^A 19	B	20 51	LIB	9
201	20	W.	4 25	A	7 16	E	14 51	9	7	8	3 59	E	12 51	B	20 41	SCO	10
202	21	Th.	4 26	A	7 15	E	14 49	9	8	8 33	4 59	E	1 27	A	20 29	OPH	11
203	22	Fr.	4 27	A	7 14	E	14 47	9	9	9 33	5 54	E	2 09	A	20 17	SAG	12
204	23	Sa.	4 28	A	7 13	E	14 45	9	10	10 33	6 43	E	2 57	B	20 05	SAG	13
205	24	B	4 28	A	7 12	E	14 44	9	11	11 33	7 26	E	3 50	B	19 53	SAG	14
206	25	M.	4 29	A	7 11	D	14 42	9	11	12 33	8 02	E	4 47	B	19 40	CAP	15
207	26	Tu.	4 30	A	7 10	D	14 40	9	—	12 33	8 33	E	5 47	B	19 27	CAP	16
208	27	W.	4 31	A	7 09	D	14 38	9	12	1 12	9 00	D	6 47	B	19 14	AQU	17
209	28	Th.	4 32	A	7 08	D	14 36	9	1	1 12	9 24	D	7 48	C	19 00	AQU	18
210	29	Fr.	4 33	A	7 07	D	14 34	9	1	2 12	9 47	D	8 49	C	18 46	AQU	19
211	30	Sa.	4 34	A	7 06	D	14 32	9	2	3 12	10 10	C	9 50	D	18 32	PSC	20
212	31	B	4 35	A	7 05	D	14 30	9	3	3 12	10 ^P 33	C	10 ^A 52	D	18N.17	PSC	21



Now is the high-tide of the year,
And whatever of life hath ebbed away
Comes flooding back with a ripply cheer,
Into every bare inlet and creek and bay.
— James Russell Lowell

Farmer's Calendar

Where I live the orange day lily is unfailingly a July flower. With the turn of the month, its big blossoms appear again like flags, and by the Fourth, yards and gardens are full of them. I don't know why we shouldn't call this flower the Independence Lily.

The day lily must be an old-fashioned flower, I think. There is scarcely an old house without its lily bed, and they grow on the banks beside the back roads where houses once stood. Lilies must have been a favorite garden flower of the farm wives long ago who had little time for cultivating what they didn't expect to eat. The lily was their flower because it needs little care. Just leave lilies alone and they will prosper.

The French of Canada call the orange day lily *lis d'un jour*. Both names signify that each flower blooms for a single day then dies off. Is that no more than a tale that makes a good name? I recently conducted a small experiment to find out. Around our house are two large lily beds, each producing, I suppose, several hundred flowers a year. One evening I marked four buds that seemed about to open in order that I could know and watch them. The next morning the buds were fully open. But on the morning of the second day, the four flowers I had marked were shrunken and dead, their orange petals gone a dull red-brown. New flowers had replaced them. They are day lilies, all right.

By the middle of the month the lilies show signs of passing. The ranks of flowers that crowded above their dense green beds, each flower a small bright fire in the garden's checkered shade, are thinner. In another week there won't be day lilies. In midsummer their flowers come to remind us of autumn with a scrap of autumn's color and an image of its brevity.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Fr.	Dominion Day, Canada • 25 sq. miles of ice on Lake Superior, 1876 •	Not
2	Sa.	Visit. of Mary • ½ stat. • Tides [8.9	all
3	B	6 th S. af. P. • ☾ on Eq. • Dog Days begin. [8.6	that
4	M.	Independence Day • Corn should be knee-high. [8.6	sunny,
5	Tu.	John Rogers left \$5 million to Met. Museum of Art, N.Y.C., 1901 •	my
6	W.	⊕ at aphelion, 5 A.M. • First talking movie, N.Y.C., 1928 •	honey.
7	Th.	Laziness travels so slowly that poverty soon overtakes him • Tides [8.8	In and
8	Fr.	⊕ at ☾ • American premiere of Mozart's Symphony in F. K. 19A, 1981 •	out
9	Sa.	♀ sup. conj. • ♂ ♀ Regulus • Beirut destroyed by earthquakes, 551 •	for
10	B	7 th S. af. P. • ☾ runs high • New • [9.7	your
11	M.	⊕ at peri. • 5.10" rain in one hour, Tucson, Ariz., 1878 •	umbrella.
12	Tu.	Alexander Hamilton d. • Highest after duel with Burr, 1804 • a.m. tide [11.8	Now
13	W.	♂ ♀ ☾ • Heat wave killed 260 in 24 hrs., N.Y.C., 1892 • [11.7	you'll
14	Th.	⊕ stat. • Bastille • Gerald Ford b. 1913 • Tides [11.4	be a
15	Fr.	St. Swithin • Rain today means [10.9	happy
16	Sa.	☾ on Eq. • Czar of Russia and family executed by Bolsheviks, 1918 • [10.2	fella.
17	B	8 th S. af. P. • ♂ ♀ ☾ • [9.7	Back to
18	M.	76-lb. striped bass caught off Montauk, L.I., 1981 • Tides [9.2	moisture
19	Tu.	♀ Greatest Brilliancy • ♂ ♀ ☾ • Women's rights convention, Seneca Falls, N.Y., 1848 •	in
20	W.	St. Margaret • ♂ ☾ ☾ • the cloister. [9.9	
21	Th.	⊕ at ☾ • ♂ ♀ ☾ • Liberty Bell muffled to toll death of Lafayette, 1834 •	Plenty
22	Fr.	St. Mary Magdalen • Tides [8.5	sunny,
23	Sa.	☾ runs low • 31st day of +100° heat, Dallas, Tex., 1980 • Tides [8.5	warm
24	B	9 th S. af. P. • Full ☾ • Simon Bolivar b. 1783 •	but
25	M.	St. James • Now state of the crops is known. • Tides [8.7	thunder.
26	Tu.	St. Anne • ☾ at 96° Eastport, Me., 1963 (record high) •	Then
27	W.	Comscateous • Settlers captured by air now. • Indians, Hinsdale, N.H., 1755 •	it's
28	Th.	Noah opened windows of Ark, 2348 B.C. • Robespierre guillotined, 1794 •	hot
29	Fr.	⊕ stat. • Charles, Prince of Wales, married Lady Diana Spencer, 1981 • [9.6	and
30	Sa.	☾ on Eq. • Emily Brontë b. 1818 • Henry Ford b. 1863 • [9.4	that's no
31	B	10 th S. af. P. • St. Ignatius of Loyola • [9.0	blunder.

1983

AUGUST, THE EIGHTH MONTH

The Perseid meteors are producing even greater displays than usual. This year the moon is out of the way during the peak hours after midnight on the 12th and 13th. Clear sky observers may see more than 100 of these swift meteors from the north at these times. Watch Venus make an early dramatic exit from the evening sky. Binoculars will show a skinny crescent because it is passing near us in early August, reaching inferior conjunction almost behind the sun on the 24th, and reappearing in the east just before sunrise at month's end. The Milky Way is widest and most glorious in the south near the Teapot pattern of Sagittarius.

ASTRONOMICAL CALCULATIONS

☾	Last Quarter	1st day,	19th hour	53 min.
●	New Moon	8th day,	14th hour	19 min.
☾	First Quarter	15th day,	7th hour	48 min.
○	Full Moon	23rd day,	10th hour	0 min.
☾	Last Quarter	31st day,	6th hour	23 min.

ADD 1 hr. for Daylight Saving Time.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☺ Rises h. m.	Key	☺ Sets h. m.	Key	Length of Days h. m.	Sun Fast	Full Sea Boston A.M. P.M.	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declina- tion of sun °	☾ Place	☾ Age
213	1	M.	4 36	A	7 04	D	14 28	9	4 41	11 ^M 00	B	11 ^A 56	E	18N.02	PSC	22
214	2	Tu.	4 37	A	7 03	D	14 26	9	4 5	11 ^M 29	B	1 ^P 03	E	17 47	ARI	23
215	3	W.	4 38	A	7 02	D	14 24	9	5 6	—	—	2 12	E	17 31	TAU	24
216	4	Th.	4 39	A	7 00	D	14 21	9	6 7	12 ^M 05	B	3 23	E	17 15	TAU	25
217	5	Fr.	4 40	A	6 59	D	14 19	9	7 8	12 50	B	4 33	E	16 59	TAU	26
218	6	Sa.	4 42	A	6 58	D	14 16	9	8 9	1 45	B	5 37	E	16 43	GEM	27
219	7	B	4 43	A	6 57	D	14 14	9	9 9	2 52	B	6 33	E	16 26	GEM	28
220	8	M.	4 44	A	6 55	D	14 11	9	10 10	4 07	B	7 19	E	16 09	CAN	0
221	9	Tu.	4 45	A	6 54	D	14 09	9	11 11	5 26	C	7 58	D	15 52	LEO	1
222	10	W.	4 46	A	6 53	D	14 07	10	— 12	6 46	C	8 30	D	15 35	LEO	2
223	11	Th.	4 47	A	6 51	D	14 04	10	12 1	8 03	D	8 59	D	15 17	VIR	3
224	12	Fr.	4 48	A	6 50	D	14 02	10	1 2	9 18	D	9 26	C	15 00	VIR	4
225	13	Sa.	4 49	A	6 49	D	14 00	10	2 23	10 29	D	9 53	B	14 41	VIR	5
226	14	B	4 50	B	6 47	D	13 57	10	3 3	11 ^A 38	E	10 21	B	14 23	VIR	6
227	15	M.	4 51	B	6 46	D	13 55	10	4 4	12 ^M 46	E	10 52	B	14 04	LIB	7
228	16	Tu.	4 52	B	6 44	D	13 52	11	5 5	1 51	E	11 ^P 27	B	13 45	LIB	8
229	17	W.	4 53	B	6 43	D	13 50	11	6 6	2 53	E	—	—	13 26	OPH	9
230	18	Th.	4 54	B	6 41	D	13 47	11	7 8	3 50	E	12 ^M 07	A	13 07	SAG	10
231	19	Fr.	4 55	B	6 40	D	13 45	11	8 8	4 42	E	12 53	A	12 48	SAG	11
232	20	Sa.	4 56	B	6 38	D	13 42	12	9 9	5 26	E	1 45	A	12 28	SAG	12
233	21	B	4 57	B	6 37	D	13 40	12	9 10	6 04	E	2 41	B	12 08	CAP	13
234	22	M.	4 58	B	6 35	D	13 37	12	10 10	6 36	E	3 40	B	11 48	CAP	14
235	23	Tu.	4 59	B	6 33	D	13 34	12	11 11	7 04	D	4 41	B	11 28	AQU	15
236	24	W.	5 01	B	6 32	D	13 31	13	11 11	7 29	D	5 42	C	11 08	AQU	16
237	25	Th.	5 02	B	6 30	D	13 28	13	12 12	7 52	D	6 42	C	10 47	AQU	17
238	26	Fr.	5 03	B	6 29	D	13 26	13	12 1	8 15	C	7 43	D	10 26	PSC	18
239	27	Sa.	5 04	B	6 27	D	13 23	13	1 1	8 37	C	8 45	D	10 06	CET	19
240	28	B	5 05	B	6 25	D	13 20	14	2 2	9 02	B	9 48	E	9 45	PSC	20
241	29	M.	5 06	B	6 24	D	13 18	14	2 3	9 29	B	10 ^A 53	E	9 23	ARI	21
242	30	Tu.	5 07	B	6 22	D	13 15	14	3 3	10 02	B	12 ^P 00	E	9 02	ARI	22
243	31	W.	5 08	B	6 20	D	13 12	15	4 4	10 ^M 41	A	1 ^P 08	E	8N.40	TAU	23



O sweet the dropping eve, the blush of morn,
The starlit sky, the rustling fields of corn,
The soft airs blowing from the freshening seas,
The sunflecked shadow of the stately trees.

— Celia Thaxter

Farmer's Calendar

In my own year late summer is the season for scientific wood-lugging. There is a pile of firewood in the yard that needs to be moved into the woodshed, a matter of seven or eight cords. Wood-lugging is about the biggest outside job I do each year. It's a job of such size, and of such overpowering monotony, that it teaches well how to set about a long, heavy undertaking.

You can lug your wood in half-hours between other jobs, but you do better to stick to the work. You might not get the whole job done before winter if you try to fit it in around other work. Also, a piecemeal approach to a job like wood-lugging courts early discouragement. A random pile of, say, eight cords of split wood is nearly the size of a small house. You can take pieces out of it steadily for a couple of hours without reducing the pile much. If you have big wood to lug, you had best forget other occupations and dedicate whole days, and not just odd hours, to the task.

You want to be able to survive a full day of lugging wood, however. Your neighbor, a husky fellow who after breakfast attacks his woodpile as though he were a forklift, stacking himself with ever heavier armloads, will be out of action by half-past ten, no matter how strong he is. Don't rely on strength. Strength doesn't matter in doing heavy work if the work is long. However strong you are, the woodpile is stronger. Don't try to do the work with your mighty back and arms; do it with your legs. If you have a ton to move, that is, make 200 ten-pound trips, not 40 fifty-pound trips. The principle is: *Load light and go often*. The workers who built the pyramids and the cathedrals knew this principle. It's still good after all these years. It will show you how to stick to your job until it is done.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	M.	Lammas Day • ♀ stat. • [8.8 9.2	<i>Clear,</i>
2	Tu.	Warren G. Harding • First iron mailboxes d. 1923 used, Boston, 1858 [8.6 9.4	<i>then</i>
3	W.	Race tack opened. • Joseph Conrad Saratoga, N.Y., 1863 d. 1924	<i>just</i>
4	Th.	♂ ♂ Pollux • <i>A little leaven lightens the whole lump.</i> • [8.5 10.0	<i>a</i>
5	Fr.	⊙ at ♀ • Julia Holmes first woman to climb Pike's Peak, 1858 [8.7 10.5	<i>tad</i>
6	Sa.	Transfiguration • runs high • ♂ ♀ ♀ <i>bad.</i>	
7	B	11th S. af. P. • ♂ ♂ ☾ • <i>Sunshine</i>	
8	M.	New • ☾ at peri. • First America's Cup Race, 1870 [9.9 11.7	<i>and</i>
9	Tu.	St. Laurence of Rome ♂ ♀ ☽ Highest P.M. tide of year [10.3 11.8	<i>fun</i>
10	W.	♂ ♀ ☾ • Fine weather today means a good autumn. <i>before</i>	
11	Th.	Dog Days end. • Hayfever season • Tides [11.7 10.8	<i>showers</i>
12	Fr.	☾ on • 120°, Seymour, • Tides [11.4 Eq. Tex., 1936 [10.8	<i>come.</i>
13	Sa.	♂ ♀ ☾ • <i>Beware of enemies reconciled and of meat twice boiled.</i> • <i>To the</i>	
14	B	12th S. af. P. • ☽ stat. • <i>beach,</i>	
15	M.	90-day wage-price- rent freeze, 1971 • Jesuits founded, 1534 [9.4 10.0	<i>my little</i>
16	Tu.	♂ ♀ ☾ • ♂ ♂ ☾ • Rain at Battle of Bennington, Vt., 1777 <i>peach.</i>	
17	W.	⊙ at ☽ • Cat nights commence. • Tides [8.4 9.5	<i>Are</i>
18	Th.	♂ ♀ ☾ • Helen Wills won U.S. tennis singles championship, 1923 <i>those</i>	
19	Fr.	☾ runs • ♀ Gr. Elong. • Orville Wright E. (27) b. 1871 <i>sprinkles</i>	
20	Sa.	250 lost in collision of <i>Atlantic</i> and <i>Ogdensburg</i> , Lake Erie, 1852 • [8.3 9.5	<i>in your</i>
21	B	13th S. af. P. • Tornado, Rochester, Minn., 1883 <i>wrinkles?</i>	
22	M.	⊙ at • Henry Kissinger named • Tides [8.7 apo. Secretary of State, 1973 [9.8	<i>Dark</i>
23	Tu.	Full • <i>Empress of China</i> first U.S. Sturgeon ship in China, 1784 <i>clouds</i>	
24	W.	St. Bartholomew • Lafayette visited Boston, 1824 <i>glower —</i>	
25	Th.	♀ inf. • Killing frost, • Tides [9.9 conj. Fargo, N.D., 1885 [9.2	<i>watch</i>
26	Fr.	☾ on • Charles Lindbergh • Tides [9.8 Eq. d. 1974 [9.3	<i>us</i>
27	Sa.	<i>A wise man reflects and then speaks; A fool speaks and then reflects.</i> • [9.7 9.4	<i>cower</i>
28	B	14th S. af. P. • Sen. Thurmond filibustered against Civil Rights Act, 1957	
29	M.	John the Baptist • Ingrid Bergman • Tides [9.2 beheaded b. 1917 [9.5	<i>in</i>
30	Tu.	"Hot line" to Moscow • 99° Boston, opened, 1963 Mass., 1973 [8.9 9.5	<i>the</i>
31	W.	First transcontinental auto trip — Frisco to N.Y. in a Packard in 52 days, 1903 • <i>shower.</i>	

1983

SEPTEMBER, THE NINTH MONTH

Many claim the Harvest Moon is the full one nearest this fall equinox, which makes it the full moon of September 22nd. This September moon will seem to rise at nearly the same time (really about 20 to 30 minutes later, instead of the usual average of around 50) each night for a number of evenings around the time of fullness. Venus leaps up higher in the pre-dawn sky each day. On the 28th and 29th, look below Venus for Mars to be the dimmer object about a degree from the star Regulus. High overhead soars Cygnus the Swan, flying down the Milky Way — southward, as most Northern Hemisphere birds now do. Low in the southwest, Jupiter passes Beta Scorpii (on the 3rd) and Uranus (on the 24th) for the third and final time in 1982. It will not meet Uranus again until 1997.

ASTRONOMICAL CALCULATIONS

● New Moon	6th day,	21st hour	36 min.
☾ First Quarter	13th day,	21st hour	25 min.
○ Full Moon	22nd day,	1st hour	37 min.
☾ Last Quarter	29th day,	15th hour	6 min.

ADD 1 hr. for Daylight Saving Time.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☺ Rises h. m.	Key	☺ Sets h. m.	Key	Length of Days h. m.	Sun East m.	Full Sea Boston A.M. P.M.	☾ Rises h. m.	Key	☾ Sets h. m.	Key	Declination of sun °	☾ Place	☾ Age	
244	1	Th.	5 09	B	6 19	D	13 10	15	5 1	5 1	11 ^P _M 30	A	2 ^P _M 17	E	8N.19	TAU	24
245	2	Fr.	5 10	B	6 17	D	13 07	15	6 1	6 1	—	—	3 22	E	7 57	GEM	25
246	3	Sa.	5 11	B	6 15	D	13 04	16	7 1	7 1	12 ^A _M 30	B	4 20	E	7 35	GEM	26
247	4	B	5 12	B	6 14	D	13 02	16	8 1	8 1	1 40	B	5 09	E	7 13	CAN	27
248	5	M.	5 13	B	6 12	D	12 59	16	9 1	9 1	2 57	B	5 50	E	6 50	CAN	28
249	6	Tu.	5 14	B	6 10	D	12 56	17	10 1	10 1	4 16	C	6 25	D	6 28	LEO	0
250	7	W.	5 15	B	6 08	C	12 53	17	11 1	11 1	5 35	D	6 56	D	6 06	LEO	1
251	8	Th.	5 16	B	6 07	C	12 51	17	—	12	6 53	D	7 24	D	5 43	VIR	2
252	9	Fr.	5 17	B	6 05	C	12 48	18	12 1	12 1	8 08	D	7 52	C	5 20	VIR	3
253	10	Sa.	5 19	B	6 03	C	12 44	18	1 1	1 1	9 21	E	8 20	B	4 58	VIR	4
254	11	B	5 20	B	6 01	C	12 41	18	2 1	2 1	10 32	E	8 50	B	4 35	LIB	5
255	12	M.	5 21	B	6 00	C	12 39	19	3 1	3 1	11 ^A _M 40	E	9 24	B	4 12	LIB	6
256	13	Tu.	5 22	B	5 58	C	12 36	19	4 1	4 1	12 ^P _M 45	E	10 03	A	3 49	OPH	7
257	14	W.	5 23	B	5 56	C	12 33	19	5 1	5 1	1 45	E	10 48	A	3 26	OPH	8
258	15	Th.	5 24	B	5 54	C	12 30	20	6 1	6 1	2 38	E	11 ^P _M 38	A	3 03	SAG	9
259	16	Fr.	5 25	B	5 53	C	12 28	20	7 1	7 1	3 25	E	—	—	2 40	SAG	10
260	17	Sa.	5 26	B	5 51	C	12 25	20	8 1	8 1	4 05	E	12 ^A _M 33	B	2 17	CAP	11
261	18	B	5 27	B	5 49	C	12 22	21	9 1	9 1	4 38	E	1 31	B	1 54	CAP	12
262	19	M.	5 28	B	5 47	C	12 19	21	10 1	10 1	5 08	E	2 32	B	1 30	CAP	13
263	20	Tu.	5 29	B	5 46	C	12 17	21	11 1	11 1	5 34	D	3 33	C	1 07	AQU	14
264	21	W.	5 30	B	5 44	C	12 14	22	12 1	12 1	5 57	D	4 35	C	0 44	AQU	15
265	22	Th.	5 31	B	5 42	C	12 11	22	13 1	13 1	6 20	C	5 36	C	0N.21	PSC	16
266	23	Fr.	5 32	B	5 40	C	12 08	22	14 1	14 1	6 42	C	6 38	D	0S.02	CET	17
267	24	Sa.	5 33	B	5 39	C	12 06	23	15 1	15 1	7 06	B	7 41	D	0 25	PSC	18
268	25	B	5 34	B	5 37	C	12 03	23	16 1	16 1	7 32	B	8 46	E	0 49	CET	19
269	26	M.	5 36	B	5 35	C	11 59	24	17 1	17 1	8 02	B	9 53	E	1 12	ARI	20
270	27	Tu.	5 37	C	5 33	B	11 56	24	18 1	18 1	8 39	B	11 ^A _M 01	E	1 36	TAU	21
271	28	W.	5 38	C	5 31	B	11 53	24	19 1	19 1	9 24	B	12 ^P _M 08	E	1 59	TAU	22
272	29	Th.	5 39	C	5 30	B	11 51	25	20 1	20 1	10 18	A	1 13	E	2 22	GEM	23
273	30	Fr.	5 40	C	5 28	B	11 48	25	21 1	21 1	11 ^P _M 22	B	2 ^P _M 11	E	2S.46	GEM	24



The morns are meeker than they were,
The nuts are getting brown;
The berry's cheek is plumper,
The rose is out of town.

— Emily Dickinson

Farmer's Calendar

Why is it that Nature so seldom sends the gardener a year that is unarguably either good or bad? The garden's diversity accounts for it: With plants of so many different kinds, it's not in the cards that one pest or disease, one early frost, one dry or rainy month will do the whole lot of them in. On the other hand, it's equally unlikely that in any one year conditions favoring a whole gardenful of various plants will prevail to produce abundance across the board.

Therefore, we have years of cucumber boom and cucumber bust, and similar results for the rest of the crops. In my own case, if I were a better gardener I would take steps to rectify this situation by scientifically giving a hand to whichever vegetables appear to fail each year. But I'm no better a gardener than I am, and anyway I enjoy seeing what the payoff will be as the garden finishes.

I've noticed that yearly fluctuations in the garden's fortunes are mostly confined to the vegetables of higher estate. It's my impression that the likelihood of a plant's thriving through the vicissitudes of successive garden years is in inverse proportion to its glamour. The lettuces, carrots, radishes, and their humble kind are pretty consistent, while peppers, tomatoes, and squash finish one year in plenty, another in dearth. If I compare my garden to a horse race, tomatoes and potatoes recorded Win and Place for me last year, while buttercup squash finished out of the money. Almost unnoticed, spinach and parsley ran the course creditably, as they always do. If a figurative horse race may decline into a dog race, gardening is just like the greyhounds. You know what they say at the dog track: Nobody bets on the rabbit, but the rabbit always wins.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Th.	St. Giles • ☾ at ☾ • ♀ stat. • Tides { 8.4 126°, Mecca, Calif., 1950 • V-J Day, 1945 • Tides { 8.5	<i>Sunny</i>
2	Fr.	☾ runs • Treaty of Paris ended Rev. War, 1783 • { 8.7	<i>days</i>
3	Sa.	☾ high • 15 th S. af. P. • ♂ ♂ ☾ • { 9.2	<i>still are</i>
4	B	Labor Day • ♂ ♀ ☾ • Jesse James b. 1847 • { 10.8	<i>here.</i>
5	M.	New • ☾ at peri. • Pres. McKinley assassinated, 1901 • { 10.3	<i>A little</i>
6	Tu.	♂ ☾ • Crazy Horse killed during escape, 1877 • Tides { 10.8	<i>rain</i>
7	W.	♂ ☾ • Nativ. of Mary • ☾ Eq. • ♀ stat. • { 11.7	<i>but</i>
8	Th.	If you do what you should not, you must bear what you would not • Tides { 11.5	<i>mostly</i>
9	Fr.	♂ ☾ • First snow in Johannesburg, S. Africa, in 17 years, 1981 • { 11.2	<i>clear.</i>
10	Sa.	♂ ☾ • 16 th S. af. P. • "Oh, Susanna" first sung, Pittsburgh, 1847 • { 9.8	<i>Drizzle</i>
11	B	♂ ☾ • Hot, dry winds crumbled tree foliage, Kansas, 1882 • { 10.3	<i>returns</i>
12	M.	☾ at ☾ • Gen. John J. Pershing b. 1860 • Tides { 9.1	<i>with a</i>
13	Tu.	Holy Cross • ♀ stat. • ♂ ☾ ☾ • ♂ ♀ ♂ • { 9.8	<i>hint of</i>
14	W.	♀ inf. • Krushchev first Russian head of state to visit U.S., 1959 • { 8.1	<i>cool.</i>
15	Th.	conj. • 101.2°, San Francisco, 1913 • Tides { 9.0	<i>Take</i>
16	Fr.	☾ runs • Battle of Antietam began, Md., 1862 • { 8.0	<i>one</i>
17	Sa.	Yom Kippur • ☾ at apo. • { 9.0	<i>more</i>
18	B	17 th S. af. P. • First balloon ascension carrying live animals, Versailles, France, 1783 • { 9.2	<i>dip in</i>
19	M.	Jelly Roll Morton b. New Orleans, 1885 • Chicago founded, 1837 • { 9.7	<i>the pool.</i>
20	Tu.	St. Matthew • Full Day • Tides { 9.8	<i>Wet</i>
21	W.	Succoth • ☾ Harvest • Tides { 9.5	<i>then</i>
22	Th.	☾ on Eq. • 9:42 A.M. • ♀ stat. • Tides { 9.8	<i>hot</i>
23	Fr.	☾ on Eq. • 9:42 A.M. • ♀ stat. • Tides { 9.8	<i>and</i>
24	Sa.	♂ ☾ • F. Scott Fitzgerald b. 1896 • { 9.8	<i>then</i>
25	B	18 th S. af. P. • Snow, Jackson, N.H., 1905 • { 9.4	<i>we've</i>
26	M.	St. Cyprian • Charge of the Light Brigade, 1854 • Tides { 9.9	<i>got</i>
27	Tu.	There are but few men who have character enough to lead a life of idleness. • { 9.7	<i>some</i>
28	W.	☾ at ☾ • ♂ ☾ Regulus d. 1973 • { 8.6	<i>more</i>
29	Th.	St. Michael • War Dept. established regular army of 700, 1789 • { 9.7	<i>of</i>
30	Fr.	St. Jerome • ☾ runs high • Porgy and Bess opened, Boston, 1935 • { 9.7	<i>thot.</i>

Most people repent of their sins by thanking God they ain't so wicked as their neighbors.

1983

OCTOBER, THE TENTH MONTH

Venus is at greatest brilliancy on the 1st, its journey visible in the daytime sky. That day, Mercury is 18 degrees west of the sun and should be conspicuous shortly before sunup. Far south of Mars last month, on the 28th Venus is less than 2 degrees south of the fainter planet, farther but higher than in February. The evening summer triangle is still high in the west, with tiny Delphinus the Dolphin swimming after it. Pegasus is prominent and high in the southeast. Fomalhaut is the lone bright star in the south, amidst a Celestial Sea of mostly dim aquatic constellations, the most famous of which are Capricornus, Aquarius, Pisces, and Cetus the Whale. Jupiter is passing north of Antares in Scorpius for the last time.

ASTRONOMICAL CALCULATIONS

● New Moon	6th day,	6th hour	17 min.
☾ First Quarter	13th day,	14th hour	43 min.
○ Full Moon	21st day,	16th hour	54 min.
☾ Last Quarter	28th day,	22nd hour	38 min.

ADD 1 hr. for Daylight Saving Time until 2 A.M. Oct. 30.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	 Rises h. m.	Key	 Sets h. m.	Key	Length of Days h. m.	Sun Fast m.	Full Sea Boston A.M. P.M.	 Rises h. m.	Key	 Sets h. m.	Key	Declination of sun °	 Place	 Age	
274	1	Sa.	5 41	C	5 26	B	11 45	25	6	61	—	3 ^P 03	E	3s.09	CAN	25	
275	2	B	5 42	C	5 25	B	11 43	26	7	7	12 ^A 34	B	3 46	E	3 32	CAN	26
276	3	M.	5 43	C	5 23	B	11 40	26	8	8	1 51	B	4 22	E	3 55	LEO	27
277	4	Tu.	5 44	C	5 21	B	11 37	26	9	9	3 08	C	4 53	D	4 18	LEO	28
278	5	W.	5 45	C	5 19	B	11 34	26	9	10	4 26	D	5 22	D	4 41	VIR	29
279	6	Th.	5 47	C	5 18	B	11 31	27	10	11	5 42	D	5 49	C	5 05	VIR	0
280	7	Fr.	5 48	C	5 16	B	11 28	27	11	—	6 56	E	6 17	B	5 28	VIR	1
281	8	Sa.	5 49	C	5 14	B	11 25	27	12	12 ¹	8 09	E	6 46	B	5 51	LIB	2
282	9	B	5 50	C	5 13	B	11 23	28	12	1	9 21	E	7 19	B	6 13	LIB	3
283	10	M.	5 51	C	5 11	B	11 20	28	1	1	10 30	E	7 56	A	6 36	SCO	4
284	11	Tu.	5 52	C	5 09	B	11 17	28	2	2	11 ^A 33	E	8 40	A	6 59	OPH	5
285	12	W.	5 53	C	5 08	B	11 15	28	3	3	12 ^P 31	E	9 29	A	7 21	SAG	6
286	13	Th.	5 54	D	5 06	B	11 12	29	4	4	1 22	E	10 23	A	7 44	SAG	7
287	14	Fr.	5 56	D	5 04	B	11 08	29	5	5	2 04	E	11 ^P 21	B	8 06	SAG	8
288	15	Sa.	5 57	D	5 03	B	11 06	29	6	6	2 40	E	—	—	8 29	CAP	9
289	16	B	5 58	D	5 01	B	11 03	29	7	7	3 11	E	12 ^A 21	B	8 51	CAP	10
290	17	M.	5 59	D	5 00	B	11 01	30	8	8	3 37	D	1 23	B	9 13	AQU	11
291	18	Tu.	6 00	D	4 58	B	10 58	30	9	9	4 01	D	2 24	C	9 34	AQU	12
292	19	W.	6 01	D	4 56	B	10 55	30	9	9	4 24	D	3 25	C	9 56	PSC	13
293	20	Th.	6 03	D	4 55	B	10 52	30	10	10	4 46	C	4 28	D	10 18	CET	14
294	21	Fr.	6 04	D	4 53	B	10 49	30	10	11	5 09	C	5 31	D	10 39	PSC	15
295	22	Sa.	6 05	D	4 52	B	10 47	30	11	11	5 35	B	6 36	E	11 00	PSC	16
296	23	B	6 06	D	4 50	B	10 44	31	—	12	6 04	B	7 44	E	11 21	ARI	17
297	24	M.	6 07	D	4 49	B	10 42	31	12	12	6 38	B	8 52	E	11 42	TAU	18
298	25	Tu.	6 09	D	4 48	B	10 39	31	1	1	7 21	A	10 01	E	12 03	TAU	19
299	26	W.	6 10	D	4 46	B	10 36	31	1	2	8 13	A	11 ^A 08	E	12 24	TAU	20
300	27	Th.	6 11	D	4 45	B	10 34	31	2	3	9 13	B	12 ^P 09	E	12 45	GEM	21
301	28	Fr.	6 12	D	4 43	B	10 31	31	3	4	10 22	B	1 01	E	13 05	GEM	22
302	29	Sa.	6 14	D	4 42	B	10 28	31	4	5	11 ^P 35	B	1 45	E	13 25	CAN	23
303	30	B	6 15	D	4 41	B	10 26	31	5	6	—	—	2 23	E	13 45	LEO	24
304	31	M.	6 16	D	4 39	B	10 23	31	6	7	12 ^A 50	C	2 ^P 54	D	14s.04	LEO	25



Oh, days of beauty, standing veiled apart,
With dreamy skies and tender, tremulous air,
In this rich Indian summer of the heart
Well may the earth her jewelled halo wear.

— Ada Foster Murray

Farmer's Calendar

Everyone loves the autumn leaves that crowd the hillsides and roadways with their last bright show, but there is another lesser spectacle of the leaves in fall that doesn't get much press. It is a more moderate show. It's not for everyone; but it has its place in the season for those who know it. To catch it you have to seize the moment.

On the first day the fall color seems to have passed its peak and the trees begin to look bare — that very day — go to the woods. The show is there, where the newly fallen leaves cover the ground and spread their colors out among the trees and undergrowth at your feet. The woods you walk through in these few days seem to have been furnished with a Persian carpet — rich, deep, woven with every red and yellow that nature has. Several Persian carpets, in fact. For every kind of tree there is an autumn color, and a careful observer ought to be able to walk through the woods in these days with his eyes fixed steadfastly between his feet and call off all the trees he passes by species as he treads the maples' scarlet, birches' gold, and ashes' deep purple.

The leaf carpet is fleeting; its riches last for a couple of days, no more. There is a darkness to the colors of the autumn leaves lying on the ground that they don't have when they're aloft. The autumn sunlight has gone out of them; the life has gone out of them. Science will tell you that life went out of the leaves weeks earlier, before they began to turn from green. The leaves in autumn, despite all their color, are dead tissue. For my purposes, however, their life has continued and improved until now, when I can find them lying everywhere in the woods, their colors subdued, their substance beginning its quick, quiet return to earth.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Sa.	St. Remigius • ♀ Greatest Brilliancy • ♀ Gr. Elong. W. (18°) • 8.9	<i>Sunny</i>
2	B	19th S. af. P. • Paavo Nurmi d. 1973 • 10.2	<i>days,</i>
3	M.	♂ ♀ ☾ • ♂ ♂ ☾ • Day of Judgment predicted for 8 a.m. 1533 • 10.0	<i>nippy</i>
4	Tu.	☾ peri. • ♂ ♀ ☾ • Frederick Remington b. Canton, N.Y., 1861 • 10.9	<i>eves;</i>
5	W.	First radio broadcast of World Series games (Giants vs. Yankees, N.Y.C., 1921 • 11.1	<i>drops of</i>
6	Th.	St. Faith • ☾ On Eq. • New • Tides [11.1	<i>rain</i>
7	Fr.	♂ ♀ Regulus • ♂ ♀ ☾ • James Whitcomb Riley b. 1849	<i>on</i>
8	Sa.	All looks yellow to the jaundiced eye. • Clement Atlee d. 1967	<i>turning</i>
9	B	20th S. af. P. • Calliope pat., 1855 • 10.5	<i>leaves.</i>
10	M.	Columbus Day • Spiro Agnew resigned, 1973 • Tides [10.0	<i>Sorry,</i>
11	Tu.	☾ at ☾ • ♂ ♀ ☾ • DAR organized, 1890 • 9.4	<i>my dear,</i>
12	W.	♂ ♀ Antares • Columbus claimed Bahamas for Spain, 1492 • 10.1	<i>October</i>
13	Th.	☾ runs • Lunt and Fontanne in first joint stage appearance, 1924 • Tides [8.3	<i>can't</i>
14	Fr.	Knowledge and timber shouldn't be much used until they are seasoned. • 8.7	<i>all</i>
15	Sa.	Last Lincoln-Douglas debate, Alton, Ill., 1858 • Blizzard, Great Plains, 1880 • 7.9	<i>be</i>
16	B	21st S. af. P. • ☾ at apo. • Noah Webster arrived U.S., 1758 • 8.3	<i>clear.</i>
17	M.	St. Ethelred • Albert Einstein, refugee, arrived U.S., 1933 • 8.9	<i>Mild</i>
18	Tu.	St. Luke • St. Luke's Little Summer • Tides [8.7	<i>so</i>
19	W.	Gale blew Lake Erie waters into Buffalo, N.Y., 1844 • N.C. Wyeth d. 1945 • 9.5	<i>briefly.</i>
20	Th.	☾ on Eq. • P.T. Barnum opened "Show on Earth," N.Y.C., 1873 • 9.5	<i>then</i>
21	Fr.	Full Hunter's • Frigate U.S.S. Constitution launched, Boston, 1797 • 10.1	<i>rain</i>
22	Sa.	Pablo Casals • 100 th , Los Angeles, 1965 • Tides [9.6	<i>is</i>
23	B	22nd S. af. P. • ♂ ♂ ☾ • 9.6	<i>chiefly</i>
24	M.	Friction matches patented, 1836 • 40-hour work week began, 1940 • 10.4	<i>cold,</i>
25	Tu.	St. Crispin • ☾ at ☾ • Demosthenes d. 322 B.C. • 9.2	<i>then</i>
26	W.	Smallpox declared eradicated, 1978 • 84 th , Boston, 1963 • Tides [10.3	<i>—</i>
27	Th.	☾ runs high • Rita Hayworth b. 1918 • Tides [8.9	<i>easing</i>
28	Fr.	Sts. Simon and Jude • ♂ ♀ ♂ • 8.7	<i>or</i>
29	Sa.	Joseph Pulitzer d., leaving fortune to establish journalism prizes, 1911 • 9.7	<i>is</i>
30	B	23rd S. af. P. • ♀ sup. conj. • Ezra Pound b. 1885 • 9.7	<i>it</i>
31	M.	☾ at peri. • ♂ ♀ ☾ • Nevada became 36th state, 1864 • 10.1	<i>teasing?</i>

1983

NOVEMBER, THE ELEVENTH MONTH

Cassiopeia's bright letter M is high in the north sky, while the Big Dipper skims low along the north horizon. The Milky Way runs east to west. The Great Square of Pegasus, high in the southwest, is followed by the stars of Andromeda and Aries. At mid-month look overhead around 9 P.M. if you live roughly around 40 degrees north latitude, and you will behold an elongated misty patch of radiance. This is the mighty star-wheel of the Andromeda Galaxy, the farthest object easily visible to the naked eye. The Pleiades star cluster, whose early evening rising indicates All Saints Day, is floating in the east above Aldebaran and the V-shaped Hyades star cluster. On the 17th and 18th (the last fully dark hour of the night), look for Leonid meteors from high in the south after moonset.

ASTRONOMICAL CALCULATIONS

● New Moon	4th day,	17th hour	22 min.
☾ First Quarter	12th day,	10th hour	49 min.
○ Full Moon	20th day,	7th hour	30 min.
☾ Last Quarter	27th day,	5th hour	51 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	☀ Rises h. m.	☀ Key	☀ Sets h. m.	☀ Key	Length of Days h. m.	Sun Fast m.	Ful Sea Boston A.M. P.M.	☾ Rises h. m.	☾ Key	☾ Sets h. m.	☾ Key	Declination of sun °	☾ Place	☾ Age	
305	1	Tu.	6 17	D	4 38	B	10 21	31	7 3 8 1	2 ^A _M 06	C	3 ^P _M 22	D	14s.24	LEO	26	
306	2	W.	6 19	D	4 37	B	10 18	31	8 9	3 ^M 20	D	3 49	C	14 43	VIR	27	
307	3	Th.	6 20	D	4 35	B	10 15	31	9 10	4 33	D	4 15	B	15 02	VIR	28	
308	4	Fr.	6 21	D	4 34	B	10 13	31	10 10	5 46	E	4 43	B	15 20	VIR	0	
309	5	Sa.	6 22	D	4 33	B	10 11	31	11 11	6 59	E	5 14	B	15 38	LIB	1	
310	6	B	6 24	D	4 32	B	10 08	31	11 11	—	8 10	E	5 49	B	15 57	LIB	2
311	7	M.	6 25	D	4 31	B	10 06	31	12 12	9 17	E	6 30	A	16 15	OPH	3	
312	8	Tu.	6 26	D	4 30	B	10 04	31	1 1	10 19	E	7 17	A	16 32	SAG	4	
313	9	W.	6 27	D	4 28	B	10 01	31	2 2	11 ^A _M 14	E	8 10	A	16 50	SAG	5	
314	10	Th.	6 29	D	4 27	B	9 58	31	2 3	12 ^P _M 01	E	9 08	B	17 07	SAG	6	
315	11	Fr.	6 30	D	4 26	B	9 56	31	3 3	12 39	E	10 08	B	17 24	CAP	7	
316	12	Sa.	6 31	D	4 25	B	9 54	31	4 4	1 12	E	11 ^P _M 09	B	17 40	CAP	8	
317	13	B	6 32	D	4 24	B	9 52	31	5 5	1 40	D	—	—	17 56	AQU	9	
318	14	M.	6 34	D	4 23	A	9 49	31	6 6	2 04	D	12 ^A _M 11	C	18 12	AQU	10	
319	15	Tu.	6 35	D	4 23	A	9 48	30	7 7	2 27	D	1 12	C	18 27	AQU	11	
320	16	W.	6 36	D	4 22	A	9 46	30	8 8	2 49	C	2 14	D	18 42	PSC	12	
321	17	Th.	6 37	D	4 21	A	9 44	30	8 9	3 12	C	3 16	D	18 57	CET	13	
322	18	Fr.	6 38	D	4 20	A	9 42	30	9 9	3 36	B	4 21	E	19 11	PSC	14	
323	19	Sa.	6 40	D	4 19	A	9 39	30	10 10	4 04	B	5 28	E	19 26	ARI	15	
324	20	B	6 41	D	4 19	A	9 38	29	10 11	4 37	B	6 37	E	19 40	TAU	16	
325	21	M.	6 42	D	4 18	A	9 36	29	11 11	5 16	B	7 48	E	19 53	TAU	17	
326	22	Tu.	6 43	D	4 17	A	9 34	29	12 12	6 06	B	8 58	E	20 07	TAU	18	
327	23	W.	6 45	D	4 17	A	9 32	29	12 1	7 05	B	10 02	E	20 19	GEM	19	
328	24	Th.	6 46	D	4 16	A	9 30	28	1 1	8 12	B	10 59	E	20 31	GEM	20	
329	25	Fr.	6 47	D	4 15	A	9 28	28	2 2	9 25	B	11 ^A _M 47	E	20 43	CAN	21	
330	26	Sa.	6 48	E	4 15	A	9 27	28	3 3	10 39	C	12 ^P _M 25	E	20 55	LEO	22	
331	27	B	6 49	E	4 14	A	9 25	28	4 4	11 ^P _M 53	C	12 58	D	21 06	LEO	23	
332	28	M.	6 50	E	4 14	A	9 24	27	5 5	—	—	1 26	D	21 17	LEO	24	
333	29	Tu.	6 51	E	4 14	A	9 23	27	6 6	1 ^A _M 06	D	1 52	C	21 28	VIR	25	
334	30	W.	6 52	E	4 13	A	9 21	27	7 7	2 ^A _M 18	D	2 ^P _M 17	C	21s.38	VIR	26	

NOVEMBER hath 30 days.

1983



There is a wind where the rose was;
Cold rain where sweet grass was;
And clouds like sheep
Stream o'er the steep
Grey skies where the lark was.
— *Walter de la Mare*

Farmer's Calendar

Sometime in November the chickadees will turn up around the houses and yards again — after the summer birds have departed, cold has killed the summer's insects, and all the leaves are down. Their unobtrusive arrival is a last, minor sign of the turning year. The chickadee is the caretaker bird. Like his human counterpart who comes to houses in late fall after summer residents have left and sets things right for winter, the chickadee appears all alone one gray afternoon before snow and sets to work.

The chickadee has a different role and a different set of habits in fall and winter from what he has in the warm months. Like the caretaker, the caretaker bird has to live, so he has another job in summer. Then he is practically unseen, at least by me. He sticks to the thickets and brushy meadow-edges, and tends to his nest and young. The chickadee is often the small shadow-bird that you can just see hopping about in the tangle, but he's silent and you overlook him for the colorful summer birds that have star billing: the cardinals, orioles, tanagers, redstarts, and the like.

In the fall, though, the caretaker bird is back, and can be found poking intelligently around the house one chilly November day. The chickadee won't drain your pipes, or see to it that the shutters are fastened tight, or the snow fences are put up, or the foundation banking is in place. He won't do any of the things a real caretaker does. He's a caretaker of the spirit. He's here to help see you through the long winter that's ahead. If you give him seed — and sometimes even if you don't — the chickadee will keep you company from the first November day when he shows up, right along through the deepest cold and snow, and on into another spring.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Tu.	All Saints • ♂ ♀ • Stephen Crane b. 1871 • { 9.7	Bright,
2	W.	All Souls • ☾ on • Erie Canal opened, 1825 • { 10.3	but with
3	Th.	Sauk and Fox Indians signed treaty ceding Illinois to U.S., 1804 • Tides { 10.8	a
4	Fr.	New • ♀ Gr. Elong. • Will Rogers b. Oologah, Okla., 1879 • { 10.4	bite.
5	Sa.	7 th , Chicago, 1951 • Roy Rogers b. 1912 • Tides { 11.2	Drizzle
6	B	24th S. af. P. • Will Durant d. 1981 • { 10.2	makes
7	M.	☾ at ☽ • Lewis and Clark sighted Pacific, 1805 • Tides { 9.9	your
8	Tu.	♂ ♀ ☾ • Passenger pigeons darkened sky over Boston, 1630 • { 10.4	hair
9	W.	☾ runs low • Charles DeGaulle d. 1970 • Tides { 9.9	frizzle.
10	Th.	<i>The good man piles up woe, the bad man piles up dough.</i> • Tides { 8.5	Gray
11	Fr.	St. Martin • Veterans • 18 th rain, Key West, Fla., in 24 hrs., 1980 • { 9.4	skies,
12	Sa.	☾ at apo. • Elizabeth Cady Stanton b. 1815 • Tides { 8.0	snow
13	B	25th S. af. P. • 150-mph winds and cyclone, Pakistan, 1970 • { 8.6	flies.
14	M.	<i>Moby Dick</i> published, 1851 • First nuclear reactor in operation, 1943 • { 8.1	Fairer,
15	Tu.	Columbus recorded Indian use of tobacco in journal, 1492 • Tides { 8.4	then
16	W.	☾ on Eq. • William C. Handy b. 1873 • Tides { 8.8	a
17	Th.	<i>Never ask of money spent where the spender thinks it went.</i> • Tides { 9.3	rain
18	Fr.	Railroads established four standard time zones, 1883 • Tides { 9.7	of
19	Sa.	♂ ♀ ☽ • Pilgrims sighted land, 1620 • Tides { 10.1	terror.
20	B	26th af. P. • Full Beaver • Norman Thomas b. 1884 • { 9.3	Seize
21	M.	☾ at ☽ • Red Grange played last varsity game, U. of Ill., 1925 • { 9.5	that
22	Tu.	St. Cecilia • Prune grape-vines now. • Tides { 10.8	breeze.
23	W.	St. Clement • ☾ runs high • Harpo Marx b. 1893 • { 9.1	Give
24	Th.	Thanksgiving Day • Tides { 9.3	thanks —
25	Fr.	☾ at peri. • Wanton kittens make sober cats. • Tides { 9.2	for
26	Sa.	♂ ♀ ☽ • 16 satellites in orbit around earth, 1960 • { 10.1	sun
27	B	Advent • 27 th snow, New London, Conn., 1898 • { 9.1	and
28	M.	<i>If ice in November will bear a duck There's nothing thereafter but sleet and muck.</i> • { 9.8	pranks
29	Tu.	☾ on Eq. • ♂ ♀ Spica • ♂ ☾ • { 9.9	and even
30	W.	St. Andrew • ♂ ♀ ☾ • Tides { 9.5	snowbanks!

Laughing is the sensation of feeling good all over, and showing it principally in one spot. — Josh Billings

1983

DECEMBER, THE TWELFTH MONTH

This month's annular eclipse of the sun on the 4th is not quite visible from the United States. On the 19th, the moon undergoes a penumbral eclipse from 6:46 P.M. EST until 10:52 P.M. EST. There will be no more partial or total eclipses of the moon visible from all the United States for several years. This month's most spectacular sky-event should take place on the morning of the 17th, when Venus is just 0.15 degrees north of Saturn. This is the closest visible conjunction of planets in five years. Southeast in the evening sky is the most spectacular constellation, Orion, with Taurus the Bull to his upper right. The winter solstice is at 5:30 A.M. EST on the 22nd — the shortest day of the year, astronomically speaking.

ASTRONOMICAL CALCULATIONS

● New Moon	4th day,	7th hour	27 min.
☾ First Quarter	12th day,	8th hour	10 min.
○ Full Moon	19th day,	21st hour	2 min.
☾ Last Quarter	26th day,	13th hour	53 min.

FOR POINTS OUTSIDE BOSTON SEE KEY LETTER CORRECTIONS — PAGES 76-80

Day of Year	Day of Month	Day of Week	 Rises h. m.	Key	 Sets h. m.	Key	Length of Days h. m.	Sun Fast m.	Full Sea Boston A.M. P.M.	 Rises h. m.	Key	 Sets h. m.	Key	Declination of sun °	 Place	 Age
335	1	Th.	6 54	E	4 13	A	9 19	26	8 1 4 8 3 4	3 A M 29	E	2 P M 44	B	21s.47	VIR	27
336	2	Fr.	6 55	E	4 13	A	9 18	26	9 1 4 9 4 4	4 40	E	3 13	B	21 56	LIB	28
337	3	Sa.	6 56	E	4 12	A	9 16	25	10 1 4 10 3 4	5 51	E	3 45	B	22 05	LIB	29
338	4	B	6 57	E	4 12	A	9 15	25	10 3 4 11 1 4	7 00	E	4 23	B	22 13	OPH	0
339	5	M.	6 58	E	4 12	A	9 14	25	11 1 2 —	8 05	E	5 08	A	22 21	OPH	1
340	6	Tu.	6 59	E	4 12	A	9 13	24	12 1 4 12 3 4	9 03	E	5 58	A	22 28	SAG	2
341	7	W.	7 00	E	4 12	A	9 12	24	12 3 4 1 1 4	9 54	E	6 55	A	22 35	SAG	3
342	8	Th.	7 01	E	4 12	A	9 11	23	1 1 4 1 3 4	10 36	E	7 54	B	22 42	SAG	4
343	9	Fr.	7 01	E	4 12	A	9 11	23	2 1 4 2 3 4	11 12	E	8 55	B	22 48	CAP	5
344	10	Sa.	7 02	E	4 12	A	9 10	22	3 1 4 3 3 4	11 A M 41	E	9 57	C	22 54	CAP	6
345	11	B	7 03	E	4 12	A	9 09	22	3 3 4 4 1 4	12 P M 07	D	10 P M 58	C	22 59	AQU	7
346	12	M.	7 04	E	4 12	A	9 08	21	4 5 5 1 4	12 30	D	—	—	23 04	AQU	8
347	13	Tu.	7 05	E	4 12	A	9 07	21	5 5 5 1 4	12 52	D	12 A M 00	C	23 08	PSC	9
348	14	W.	7 06	E	4 12	A	9 06	21	6 6 6 1 4	1 14	C	1 00	D	23 12	CET	10
349	15	Th.	7 06	E	4 12	A	9 06	20	7 7 7 1 4	1 37	B	2 02	D	23 16	PSC	11
350	16	Fr.	7 07	E	4 13	A	9 06	20	8 8 8 2 4	2 03	B	3 07	E	23 19	CET	12
351	17	Sa.	7 08	E	4 13	A	9 05	19	8 3 4 9 1 4	2 32	B	4 16	E	23 21	ARI	13
352	18	B	7 08	E	4 13	A	9 05	19	9 10 10 3 4	3 09	B	5 27	E	23 23	TAU	14
353	19	M.	7 09	E	4 14	A	9 05	18	10 10 10 3 4	3 55	A	6 39	E	23 24	TAU	15
354	20	Tu.	7 09	E	4 14	A	9 05	18	11 11 11 4 4	4 51	A	7 47	E	23 25	GEM	16
355	21	W.	7 10	E	4 15	A	9 05	17	11 3 4 —	5 57	B	8 50	E	23 26	GEM	17
356	22	Th.	7 10	E	4 15	A	9 05	17	12 12 12 7 4	7 10	B	9 42	E	23 26	CAN	18
357	23	Fr.	7 11	E	4 16	A	9 05	16	1 1 4 1 1 4	8 27	B	10 25	E	23 26	CAN	19
358	24	Sa.	7 11	E	4 16	A	9 05	16	2 2 4 2 2 4	9 43	C	11 00	E	23 25	LEO	20
359	25	B	7 12	E	4 17	A	9 05	15	3 3 4 10 P M 57	—	D	11 30	D	23 24	LEO	21
360	26	M.	7 12	E	4 18	A	9 06	15	4 4 5 10 P M 57	—	D	11 A M 57	D	23 22	VIR	22
361	27	Tu.	7 12	E	4 18	A	9 06	14	5 5 5 12 A M 09	—	D	12 M 22	C	23 19	VIR	23
362	28	W.	7 13	E	4 19	A	9 06	14	6 6 6 1 4	1 20	E	12 48	B	23 16	VIR	24
363	29	Th.	7 13	E	4 20	A	9 07	13	7 7 7 2 4	30	E	1 15	B	23 13	LIB	25
364	30	Fr.	7 13	E	4 20	A	9 07	13	8 8 8 3 4	39	E	1 45	B	23 10	LIB	26
365	31	Sa.	7 13	E	4 21	A	9 08	12	8 3 4 9 1 4	4 A M 48	E	2 P M 21	A	23s.06	SCO	27



Come, lads, let's sing, till the rafters ring;
Come, push the can about;
From our snug fireside this Christmas-tide
We'll keep old Winter out.

— Thomas Noel

Farmer's Calendar

The first big snowstorm of the winter, when it comes, will be announced by signs astronomical, meteorological, and animal — all unreliable — and by signs human, which are a better guide. Halos around the moon, turning winds, and the activities of small birds and animals are thought to predict storm; but they do so only equivocally and subject to interpretation. Some say the sparrows run about before a storm; some say they quiet down. We can't go on intelligence as unruly as this. We need more certain predictors of storm. Let us put the stars and the birds aside and look to our own kind.

Last December I drove halfway down Vermont one day as a storm that turned out to be a foot-and-a-half came in from the southeast. The snow hadn't started yet, but there were plenty of signs that it would before long. Among them, no doubt, were birds in particular and significant patterns of rest or activity. I didn't notice the birds, though. I did notice a man on a bucket loader busy filling a dump truck with sand from a new three-story-high pile beside a town garage. In the villages I passed, people had moved their cars off the street and parked them in narrow driveways or even on front lawns. I saw a couple of people wrestling snowplows out of the weeds and horsing them up onto the fronts of pickup trucks.

I can read these signs. I might ignore a low-flying chickadee, but I won't ignore the portent of the aforementioned driver of the bucket loader and his work, probably because I know what's on the driver's mind. He's got a job ahead of him; he's a little afraid of the storm that's looming, as am I. I can't believe chickadees worry about the weather that they are alleged to foreshadow.

D.M.	D.W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	Th.	♂ ♂ ☉ • David Ben Gurion d. 1973 • Tides [10.3 9.6]	<i>A bit</i>
2	Fr.	Three may keep a secret if two of them are dead. • [10.6 9.6]	<i>of</i>
3	Sa.	♂ ♀ ♀ • Oberlin, first co-ed college, opened, 1833 • [10.8 9.5]	<i>bluster.</i>
4	B	2 nd S. Advent • ☾ at ♀ • New • Eclipse ☉	
5	M.	♂ ♀ ☾ • Ty Cobb d. 1951 • Tides [10.7 —]	<i>—</i>
6	Tu.	St. Nicholas • Gerald Ford sworn in as Pres., 1973 • • then	
7	W.	☾ runs low • Diligence is the mother of good luck. • • filibuster.	
8	Th.	Concept. of V.M. • Tides [8.7 9.8]	<i>Mercury</i>
9	Fr.	Noah Webster established first daily newspaper, N. Y.C., 1793 • [8.5 9.4]	<i>takes</i>
10	Sa.	☾ at apo. • First domestic jet service, 1958 • [8.3 9.0]	<i>the</i>
11	B	3 rd S. Advent • Tides [8.2 8.7]	<i>plunge.</i>
12	M.	Time can say nothing but "I told you so." • Tides [8.2 8.4]	<i>Last</i>
13	Tu.	St. Lucy ♀ Gr. Elong. • Heinrich Heine b. 1797 • • chance	
14	W.	☾ on Eq. • ♂ ♀ ☉ • Ember Day • Tides [8.5 8.3]	<i>to</i>
15	Th.	Sitting Bull killed during arrest, 1890 • Alger Hiss indicted, 1948 • • bring in	
16	Fr.	Ember • Mayflower anchored in Plymouth harbor, 1620 • Tides [9.3 8.5]	<i>wood.</i>
17	Sa.	St. Lazarus ♂ ♀ ♀ • Ember Day • [9.8 8.8]	<i>Shovel</i>
18	B	4 th S. Advent • First human voice beamed by satellite, 1958 •	
19	M.	☾ at ☉ • Full Cold • Eclipse ☉ • • on the	
20	Tu.	Louisiana Territory became part of U.S., 1803 • Tides [11.0 9.9]	<i>double.</i>
21	W.	St. Thomas ☾ runs high • ♂ ♀ ☉ • ♀ stat. • Storm	
22	Th.	Solstice 5:30 A.M. • ☾ at peri. • Tides [9.6 11.2]	<i>proves</i>
23	Fr.	A masterly retreat is in itself a victory. • Tides [9.6 11.0]	<i>false,</i>
24	Sa.	Gen. George Washington returned to Mount Vernon, 1783 • [9.6 10.7]	<i>skaters</i>
25	B	Christmas • Clara Barton b. 1821 • • waltz.	
26	M.	St. Stephen Adm. Dewey • Tides [9.6 9.8]	<i>Yearn</i>
27	Tu.	St. John ☾ on Eq. • ♂ ♂ Spica • ♂ ♂ ☾ • for a	
28	W.	Holy Innocents • Tides [9.8 9.1]	<i>sunburn?</i>
29	Th.	Texas became 28 th state, 1845 • Tides [9.9 8.9]	<i>Wintry</i>
30	Fr.	First Los Angeles freeway dedicated, 1940 • Tides [10.1 8.8]	<i>blast.</i>
31	Sa.	St. Sylvester ♀ inf. • Begin the New Year square with every man. — Rob't B. Thomas	

TIDE CORRECTIONS

Many factors affect the time and height of the tides: the coastal configuration, the time of the moon's southing (crossing the meridian) at the place, and the phase of the moon. This table of tidal corrections is a sufficiently accurate guide to the times and heights of the high water at the places shown. (Low tides occur approximately 6 hours before and after high tides.) No figures are shown for most places on the Gulf of Mexico, since the method used in compiling this table does not apply there. For such places and elsewhere where precise accuracy is required, recourse should be made to the Tide Tables published annually by the Distribution Div. C44, National Ocean Survey, Dept. of Commerce, Riverdale, MD 20840.

To obtain the time and height of high water at any place, apply the time difference below to the daily times of high water at Boston (Commonwealth Pier) as they appear on left-hand pages 46-72, and the height difference to the daily heights at Boston given on right-hand pages 47-73. Where the value in the "height difference" column is marked by an *, height at Boston should be multiplied by this ratio.

		Time Difference Hr. Min.	Height Difference Feet			Time Difference Hr. Min.	Height Difference Feet
MAINE							
Bar Harbor		-0 34	+0.9	Plymouth		+0 05	0.0
Belfast		-0 20	+0.4	Provincetown		+0 14	-0.4
Boothbay Harbor		-0 18	-0.8	Revere Beach		-0 01	-0.3
Chebeague Island		-0 16	-0.6	Rockport		-0 08	-1.0
Eastport		-0 28	+8.4	Salem		0 00	-0.5
Kennebunkport		+0 04	-1.0	Scituate		-0 05	-0.7
Machias		-0 28	+2.8	Wareham		-3 09	-5.3
Monhegan Island		-0 25	-0.8	Wellfleet		+0 12	+0.5
Old Orchard		0 00	-0.8	West Falmouth		-3 10	-5.4
Portland		-0 12	-0.6	Westport Harbor		-3 22	-6.4
Rockland		-0 28	+0.1	Woods Hole			
Stonington		-0 30	+0.1	Little Harbor		-2 50	*0.2
York		-0 09	-1.0	Oceanographic Inst.		-3 07	*0.2
NEW HAMPSHIRE				RHODE ISLAND			
Hampton		+0 02	-1.3	Bristol		-3 24	-5.3
Portsmouth		+0 11	-1.5	Sakonnet		-3 44	-5.6
Rye Beach		-0 09	-0.9	Narragansett Pier		-3 42	-6.2
MASSACHUSETTS				Newport		-3 34	-5.9
Annisquam		-0 02	-1.1	Pt. Judith		-3 41	-6.3
Beverly Farms		0 00	-0.5	Providence		-3 20	-4.8
Boston		0 00	0.0	Watch Hill		-2 50	-6.8
Cape Cod Canal				CONNECTICUT			
East Entrance		-0 01	-0.8	Bridgeport		+0 01	-2.6
West Entrance		-2 16	-5.9	Madison		-0 22	-2.3
Chatham				New Haven		-0 11	-3.2
Outer Coast		+0 30	-2.8	New London		-1 54	-6.7
Inside		+1 54	*0.4	Norwalk		+0 01	-2.2
Cohasset		+0 02	-0.7	Old Lyme		-0 30	-6.2
Cotuit Highlands		+1 15	*0.3	(Highway Bridge)			
Dennisport		+1 01	*0.4	Stamford		+0 01	-2.2
Duxbury		+0 02	-0.3	Stonington		-2 27	-6.6
(Gurnet Pt.)				NEW YORK			
Fall River		-3 03	-5.0	Coney Island		-3 33	-4.9
Gloucester		-0 03	-0.8	Fire Island Lt.		-2 43	*0.1
Hingham		+0 07	0.0	Long Beach		-3 11	-5.7
Hull		+0 03	-0.2	Montauk Harbor		-2 19	-7.4
Hyannis Port		+1 01	*0.3	New York City		-2 43	-5.0
Magnolia		-0 02	-0.7	(Battery)			
(Manchester)				Oyster Bay		+0 04	-1.8
Marblehead		-0 02	-0.4	Port Chester		-0 09	-2.2
Marion		-3 22	-5.4	Port Washington		-0 01	-2.1
Monument Beach		-3 08	-5.4	Sag Harbor		-0 55	-6.8
Nahant		-0 01	-0.5	Southampton		-4 20	*0.2
Nantasket		+0 04	-0.1	(Shinnecock Inlet)			
Nantucket		-0 56	*0.3	Willels Point		0 00	-2.3
Nauset Beach		+0 30	*0.6	NEW JERSEY			
New Bedford		-3 24	-5.7	Asbury Park		-4 04	-5.3
Newburyport		+0 19	-1.8	Atlantic City		-3 56	-5.5
Oak Bluffs		+0 30	*0.2	Bay Head (Sea Girt) ..		-4 04	-5.3
Onset		-2 16	-5.9				
(R.R. Bridge)							

	Time	Height		Time	Height
Beach Haven	-1 43	*0.24	Key West	+11 24	-9.1
Cape May	-3 28	-5.3	Miami Harbor		
Ocean City	-3 06	-5.9	Entrance	-3 18	-7.0
Sandy Hook	-3 30	-5.0	St. Augustine	-2 55	-4.9
Seaside Park	-4 03	-5.4	St. Petersburg	-9 53	-7.6
PENNSYLVANIA			Sarasota	-11 31	*0.22
Philadelphia	+2 40	-3.5	Suwannee River		
DELAWARE			Entrance	-9 01	-6.4
Cape Henlopen	-2 48	-5.3	CALIFORNIA		
Rehoboth Beach	-3 37	-5.7	Carmel	-0 22	*0.5
Wilmington	+1 56	-3.8	Catalina Island	-1 23	*0.5
MARYLAND			Crescent City	-2 05	-4.1
Annapolis	+6 23	-8.5	Eureka	+1 35	-3.4
Baltimore	+7 59	-8.3	Laguna Beach	-1 38	*0.5
Cambridge	+5 05	-7.8	Long Beach	-1 30	*0.5
Havre de Grace	+11 21	-7.7	Los Angeles	-1 33	-4.7
Point No Point	+2 28	-8.1	Mendocino	+0 03	-4.4
Prince Frederick	+4 25	-8.5	Monterey	-0 31	-4.9
(Plum Point)			San Diego	-1 41	-4.3
VIRGINIA			San Francisco	+0 45	-4.4
Cape Charles	-2 20	-7.0	Santa Barbara	-1 10	*0.5
Hampton Roads	-2 02	-6.9	Santa Cruz	-0 34	-4.9
Norfolk	-2 06	-6.6	Santa Rosa Is.	-0 03	-4.5
Virginia Beach	-4 00	-6.0	OREGON		
Yorktown	-2 13	-7.0	Astoria	+2 21	-1.5
NORTH CAROLINA			Empire-North Bend .	+1 48	-3.4
Cape Fear	-3 55	-5.0	Gold Beach	+1 45	-3.4
Cape Lookout	-4 28	-5.7	(Rogue R. Entrance)		
Currituck	-4 10	-5.8	Tillamook	+2 28	*0.6
Hatteras			WASHINGTON		
Ocean	-4 26	-6.0	Aberdeen	+2 09	-0.1
Inlet	-4 03	-7.4	Bellingham	-6 18	-1.4
Kitty Hawk	-4 14	-6.2	Cape Flaherty	+1 26	*0.8
SOUTH CAROLINA			Columbia River		
Charleston	-3 22	-4.3	Entrance (Ilwaco) .	+1 35	-2.2
Georgetown	-1 48	*0.36	Everett	-6 30	+1.1
Hilton Head	-3 22	-2.9	Long Beach	+1 07	*0.8
Myrtle Beach	-3 49	-4.4	Pacific Beach	+1 10	*0.9
St. Helena			Port Townsend	-7 04	-1.6
Harbor Entrance ..	-3 15	-3.4	Seattle	-6 21	+1.3
GEORGIA			South Bend	+2 08	-0.2
Jekyll Island	-3 46	-2.9	Tacoma	-6 14	+1.8
Saint Simon's Island .	-2 50	-2.9	ALASKA		
Savannah Beach			Anchorage	-4 58	+17.5
River Entrance	-3 14	-5.5	Juneau	+3 08	+6.1
Tybee Light	-3 22	-2.7	Kodiak	+1 53	-1.7
FLORIDA			CANADA		
Apalachicola	-7 53	*0.18	Alberton, P.E.I.	-5 45**	-7.5
Cape Kennedy	-3 59	-6.0	Charlottetown, P.E.I.	-0 45**	-3.5
Clearwater	-9 01	-6.4	Halifax, N.S.	-3 23	-4.5
Daytona Beach	-3 28	-5.3	North Sydney, N.S. .	-3 15	-6.5
Everglades City	+16 12	-7.3	St. John, N.B.	+0 30	-8.0
Fort Lauderdale	-2 50	-7.2	St. John's, Nfld.	-4 00	-6.5
Fort Myers	-7 45	*0.12	Vancouver, B.C.	-5 25	+4.2
Fort Pierce Inlet	-3 32	-6.9	Yarmouth, N.S.	-0 40	+3.0
Jacksonville					
Railroad Bridge ...	-6 55	*0.10			

**Varies widely; accurate only within 1½ hrs. Consult local tide tables for precise times and heights.

Example: The figures for Full Sea on the left-hand Calendar pages 46-72 are the times of high tide at Commonwealth Pier in Boston harbor. The heights of these tides are given on the right-hand pages 47-73. The heights are reckoned from Mean Low Water; each day has a set of figures — upper for the morning and lower for the evening. The conversion of the times of the tides at Boston to those of Bristol, Rhode Island, is given as illustration.

Sample tide calculation	High Tide Boston (p. 62)	11:00 P.M.	Tide height Boston (p. 63)	11.6 ft.
July 10th, 1983:	Correction for Bristol:	-3:24 hrs.	Correction for Bristol	-5.3 ft.
		7:36 P.M.	Tide height Bristol	6.3 ft.

TIME CORRECTION TABLES

The times of sunrise, sunset, moonrise, moonset, and the rising and setting of the planets are given for Boston only on pages 46-72 and 34-35. Use the Key Letter shown there and this table to find the number of minutes that should be added to or subtracted from Boston time to give the correct time of your city. The answer will not be as precise as that for Boston, but will be within approximately 5 minutes. If your city is not listed, find the city closest to you in both latitude and longitude and use those figures. Canadian cities appear at the end of the list. For a more complete explanation see page 26.

Time Zone Code: -1—Atlantic Std.; 0—Eastern Std.; 1—Central Std.; 2—Mountain Std.; 3—Pacific Std.; 4—Yukon Std.; 5—Alaska Hawaii Std.; 6—Bering Std.

City	North Latitude		West Longitude		Time Zone Code	Key Letters				
						A min.	B min.	C min.	D min.	E min.
Aberdeen, SD	45	28	98	29	1	+38	+46	+50	+54	+62
Akron, OH	41	5	81	31	0	+46	+43	+42	+40	+37
Albany, NY	42	39	73	45	0	+10	+10	+11	+11	+12
Albert Lea, MN	43	39	93	22	1	+25	+28	+29	+31	+34
Albuquerque, NM	35	5	106	39	2	+43	+30	+22	+15	+1
Alexandria, LA	31	18	92	27	1	+56	+36	+26	+14	-5
Allentown- Bethlehem, PA	40	36	75	28	0	+23	+19	+17	+15	+11
Amarillo, TX	35	12	101	50	1	+84	+70	+63	+56	+42
Ardmore, OK	34	10	97	8	1	+67	+53	+44	+36	+21
Asheville, NC	35	36	82	33	0	+66	+53	+46	+39	+26
Atlanta, GA	33	45	84	24	0	+78	+62	+53	+44	+29
Atlantic City, NJ	39	22	74	26	0	+24	+17	+13	+10	+3
Augusta, GA	33	28	81	58	0	+69	+52	+44	+35	+17
Augusta, ME	44	19	69	46	0	-12	-7	-5	-3	+2
Austin, TX	30	16	97	45	1	+79	+58	+47	+35	+14
Bakersfield, CA	35	23	119	1	3	+32	+19	+12	+4	-8
Baltimore, MD	39	17	76	37	0	+32	+26	+22	+19	+12
Bangor, ME	44	48	68	46	0	-18	-12	-6	-6	0
Barstow, CA	34	54	117	1	3	+25	+12	+4	-4	-18
Baton Rouge, LA	30	27	91	11	1	+53	+32	+20	+9	-12
Beaumont, TX	30	5	94	6	1	+65	+44	+32	+20	-1
Bellingham, WA	48	45	122	29	3	+4	+19	+26	+32	+48
Bemidji, MN	47	28	94	53	1	+15	+29	+35	+42	+56
Berlin, NH	44	28	71	11	0	-8	-3	0	+2	+8
Billings, MT	45	47	108	30	2	+16	+25	+29	+33	+43
Biloxi, MS	30	24	88	53	1	+44	+23	+12	0	-20
Binghamton, NY	42	6	75	55	0	+20	+20	+19	+19	+18
Birmingham, AL	33	31	86	49	1	+28	+12	+3	-6	-22
Bismarck, ND	46	48	100	47	1	+42	+53	+59	+64	+77
Boise, ID	43	37	116	12	2	+56	+59	+61	+62	+65
Brattleboro, VT	42	51	72	34	0	+4	+5	+6	+7	+8
Bridgeport, CT	41	11	73	11	0	+13	+10	+9	+7	+4
Brockton, MA	42	5	71	1	0	+1	0	0	-1	-1
Buffalo, NY	42	53	78	52	0	+26	+29	+31	+33	+37
Burlington, VT	44	29	73	13	0	+1	+6	+9	+11	+17
Butte, MT	46	1	112	32	2	+32	+41	+46	+50	+60
Cairo, IL	37	0	89	11	1	+30	+18	+12	+7	-5
Camden, NJ	39	57	75	7	0	+24	+19	+16	+13	+8
Canton, OH	40	48	81	23	0	+47	+43	+41	+39	+36
Cape May, NJ	38	56	74	56	0	+27	+19	+15	+12	+4
Carson City-Reno, NV	39	10	119	46	3	+25	+18	+15	+11	+5
Casper, WY	42	51	106	19	2	+20	+21	+22	+22	+24
Chadron, NE	42	50	103	0	2	+66	+67	+68	+68	+70
Charleston, SC	32	47	79	56	0	+62	+45	+35	+26	+9
Charleston, WV	38	21	81	38	0	+54	+46	+42	+38	+30
Charlotte, NC	35	14	80	51	0	+60	+46	+39	+32	+18
Charlottesville, VA	38	2	78	30	0	+43	+34	+30	+25	+16
Chattanooga, TN	35	3	85	19	0	+78	+65	+57	+49	+36
Cheboygan, MI	45	39	84	29	0	+41	+50	+54	+57	+66
Cheyenne, WY	41	8	104	49	2	+17	+14	+13	+11	+9
Chicago-Oak Park, IL	41	52	87	38	1	+7	+6	+5	+5	+4

City	North Latitude		West Longitude		Time Zone Code	Key Letters				
						A min.	B min.	C min.	D min.	E min.
Cincinnati-Hamilton, OH ..	39	6	84	31	0	+64	+57	+54	+50	+43
Cleveland-Lakewood, OH ..	41	30	81	42	0	+46	+43	+42	+42	+40
Columbia, SC ..	34	0	81	2	0	+64	+48	+40	+31	+16
Corpus Christi, TX	27	48	97	24	1	+83	+59	+45	+31	+7
Craig, CO	40	31	107	33	2	+32	+28	+26	+24	+19
Dallas-Fort Worth, TX	32	47	96	48	1	+72	+55	+45	+35	+18
Danville, IL	40	8	87	37	1	+13	+8	+5	+3	-2
Danville, VA	36	36	79	23	0	+49	+38	+32	+26	+15
Davenport, IA	41	32	90	35	1	+21	+19	+18	+17	+15
Decatur, AL	34	36	86	59	1	+26	+12	+4	-4	-19
Decatur, IL	39	51	88	57	1	+20	+14	+12	+9	+3
Denver-Boulder, CO	40	0	104	59	2	+25	+19	+16	+13	+8
Des Moines, IA	41	35	93	37	1	+33	+31	+30	+29	+27
Detroit-Dearborn, MI	42	20	83	3	0	+48	+48	+48	+48	+48
Dubuque, IA	42	30	90	41	1	+18	+18	+18	+19	+19
Duluth, MN	46	47	92	6	1	+7	+19	+24	+30	+42
Durham, NC	36	0	78	55	0	+50	+38	+31	+25	+13
Eastport, ME	44	54	67	0	0	-26	-19	-16	-13	-7
Eau Claire, WI	44	49	91	30	1	+13	+19	+22	+25	+31
El Paso, TX	31	45	106	29	2	+51	+32	+22	+11	-8
Elko, NV	40	50	115	46	3	+4	+1	-1	-3	-7
Ellsworth, ME	44	33	68	25	0	-19	-13	-6	-3	-2
Erie, PA	42	7	80	5	0	+37	+36	+36	+36	+35
Eugene, OR	44	3	123	6	3	+22	+26	+28	+30	+34
Fall River-New Bedford, MA	41	42	71	9	0	+3	+1	0	0	-2
Fargo, ND	46	53	96	47	1	+25	+37	+43	+49	+61
Flagstaff, AZ	35	12	111	39	2	+62	+50	+42	+35	+22
Flint, MI	43	1	83	41	0	+48	+50	+51	+51	+53
Fort Scott, KS	37	50	94	42	1	+49	+39	+34	+30	+20
Fort Smith, AR	35	23	94	25	1	+54	+41	+33	+26	+13
Fort Wayne, IN	41	4	85	9	0	+61	+58	+56	+55	+52
Fresno, CA	36	44	119	47	3	+33	+21	+15	+9	-3
Gallup, NM	35	32	108	45	2	+50	+38	+31	+24	+11
Galveston, TX	29	18	94	48	1	+70	+48	+35	+22	0
Gary, IN	41	36	87	20	1	+7	+6	+5	+4	+2
Glasgow, MT	48	12	106	38	2	0	+15	+22	+30	+46
Grand Forks, ND	47	55	97	3	1	+22	+37	+44	+51	+67
Grand Island, NE	40	55	98	21	1	+54	+51	+49	+48	+44
Grand Junction, CO	39	4	108	33	2	+41	+33	+30	+26	+19
Great Falls, MT	47	30	111	17	2	+21	+34	+41	+47	+61
Green Bay, WI	44	31	88	0	1	0	+5	+8	+10	+16
Greensboro, NC	36	4	79	47	0	+53	+41	+35	+28	+16
Hagerstown, MD	39	39	77	43	0	+36	+30	+27	+24	+17
Harrisburg, PA	40	16	76	53	0	+30	+26	+23	+21	+16
Hartford-New Britain, CT ..	41	46	72	41	0	+9	+7	+7	+6	+5
Helena, MT	46	36	112	2	2	+27	+39	+44	+49	+61
Houston, TX	29	45	95	22	1	+71	+49	+37	+25	+3
Indianapolis, IN	39	46	86	10	0	+69	+63	+60	+57	+52
Ironwood, MI	46	27	90	9	1	0	+11	+16	+21	+32
Jackson, MI	42	15	84	24	0	+54	+53	+53	+53	+53
Jackson, MS	32	18	90	11	1	+44	+26	+16	+6	-11
Jacksonville, FL	30	20	81	40	0	+75	+54	+42	+30	-10
Jefferson City, MO	38	34	92	10	1	+37	+29	+25	+20	+12
Joplin, MO	37	6	94	31	1	+51	+39	+34	+28	+17
Kalamazoo, MI	42	17	85	35	0	+58	+58	+58	+58	+58
Kanab, UT	37	3	112	32	2	+63	+52	+46	+40	+29
Keene, NH	42	56	72	17	0	+2	+4	+5	+6	+7
Knoxville, TN	35	58	83	55	0	+70	+58	+51	+45	+33
LaCrosse, WI	43	48	91	15	1	-15	-19	+21	+22	+26
Lake Charles, LA	30	14	93	13	1	+61	+40	+28	+17	-4
Lancaster, PA	40	2	76	18	0	+29	+24	+21	+18	+13
Lansing, MI	42	44	84	33	0	+53	+54	+54	+54	+55
Las Cruces, NM	32	19	106	47	2	+51	+34	+23	+12	-5
Las Vegas, NV	36	10	115	9	3	+16	+3	-4	-10	-24
Lawrence-Lowell, MA	42	42	71	10	0	-1	0	+1	+1	+2
Lewiston, ID	46	25	117	1	3	-12	-1	+4	+9	+20
Lexington-Frankfort, KY ..	38	3	84	30	0	+67	+59	+54	+50	+41

City	North		West		Time Zone Code	Key Letters				
	Latitude		Longitude			A min.	B min.	C min.	D min.	E min.
Liberal, KS	37	3	100	55	1	+77	+65	+60	+54	+42
Lincoln, NE	40	49	96	41	1	+48	+44	+43	+41	+37
Little Rock, AR	34	45	92	17	1	+47	+33	+25	+17	+ 3
Los Angeles incl. Pasadena and Santa Monica, CA	34	3	118	14	3	+32	+17	+ 9	0	-14
Louisville, KY	38	15	85	46	0	+71	+63	+59	+54	+46
Macon, GA	32	50	83	38	0	+77	+62	+50	+39	+24
Madison, WI	43	4	89	23	1	+11	+12	+13	+14	+16
Manchester-Concord, NH	42	59	71	28	0	- 1	+ 1	+ 2	+ 3	+ 4
Memphis, TN	35	9	90	3	1	+37	+23	+16	+ 8	- 5
Meridian, MS	32	22	88	42	1	+38	+20	+11	0	-17
Miami, FL	25	47	80	12	0	+79	+52	+37	+21	- 6
Miles City, MT	46	25	105	51	2	+ 3	+14	+19	+24	+35
Milwaukee, WI	43	2	87	54	1	+ 5	+ 7	+ 7	+ 8	+10
Minneapolis-St. Paul, MN	44	59	93	16	1	+19	+26	+29	+32	+39
Minot, ND	48	14	101	18	1	+37	+54	+61	+68	+85
Moab, UT	38	35	109	33	2	+47	+38	+34	+30	+21
Mobile, AL	30	42	88	3	1	+39	+19	+ 8	- 4	-24
Monroe, LA	32	30	92	7	1	+51	+34	+24	+14	- 3
Montgomery, AL	32	23	86	19	1	+29	+11	+ 1	- 9	-26
Muncie, IN	40	12	85	23	0	+65	+60	+57	+55	+50
Murdo, SD	43	53	100	43	1	+53	+57	+59	+60	+65
Nashville, TN	36	10	86	47	1	+21	+ 9	+ 3	- 4	-15
New Haven, CT	41	18	72	56	0	+11	+ 9	+ 7	+ 6	+ 4
New London, CT	41	22	72	6	0	+ 8	+ 6	+ 4	+ 3	+ 1
New Orleans, LA	29	57	90	4	1	+49	+28	+16	+ 4	-17
New York, NY	40	45	74	0	0	+17	+13	+12	+10	+ 6
Newark-Irvington-East Orange, NJ	40	44	74	10	0	+18	+14	+12	+11	+ 7
Norfolk, VA	36	51	76	17	0	+37	+27	+21	+15	+ 5
North Platte, NE	41	8	100	46	1	+63	+60	+59	+57	+55
Norwalk-Stamford, CT	41	7	73	22	0	+14	+11	+10	+ 8	+ 5
Oakley, KS	39	8	100	51	1	+70	+63	+59	+58	+53
Ogden, UT	41	13	111	58	2	+48	+45	+44	+42	+40
Ogdensburg, NY	44	42	75	30	0	+ 8	+15	+18	+21	+27
Oklahoma City, OK	35	28	97	31	1	+66	+53	+46	+38	+26
Omaha, NE	41	16	95	56	1	+43	+41	+40	+38	+36
Ortonville, MN	45	19	96	27	1	+30	+38	+41	+45	+53
Oshkosh, WI	44	1	88	33	1	+ 2	+ 6	+ 8	+10	+15
Parkersburg, WV	39	16	81	34	0	+52	+45	+42	+38	+32
Paterson, NJ	40	55	74	10	0	+17	+14	+12	+11	+ 7
Pendleton, OR	45	40	118	47	3	- 2	+ 7	+11	+15	+24
Pensacola, FL	30	25	87	13	1	+ 7	+17	+ 5	- 7	-27
Peoria, IL	40	42	89	36	1	+20	+16	+14	+12	+ 7
Philadelphia-Chester, PA	39	57	75	9	0	+25	+20	+17	+14	+ 9
Phoenix, AZ	33	27	112	4	2	+69	+53	+44	+35	+19
Pierre, SD	44	22	100	21	1	+50	+55	+57	+59	+65
Pittsburgh- McKeesport, PA	40	26	80	0	0	+42	+38	+35	+33	+28
Pittsfield, MA	42	27	73	15	0	+ 8	+ 9	+ 9	+ 9	+ 9
Pocatello, ID	42	52	112	27	2	+44	+45	+45	+46	+47
Poplar Bluff, MO	36	46	90	24	1	+35	+23	+17	+11	- 1
Portland, ME	43	40	70	15	0	- 8	- 5	- 3	- 2	+ 2
Portland, OR	45	31	122	41	3	+14	+23	+26	+30	+39
Portsmouth, NH	43	5	70	45	0	- 4	- 2	- 1	0	+ 1
Presque Isle, ME	46	41	68	1	0	-29	-17	-13	- 7	+ 4
Providence, RI	41	50	71	25	0	+ 3	+ 3	+ 1	+ 1	0
Pueblo, CO	38	16	104	37	2	+28	+18	+14	+10	+ 1
Raleigh, NC	35	47	78	38	0	+50	+37	+30	+23	+11
Rapid City, SD	44	5	103	14	2	+ 2	+ 5	+ 8	+11	+14
Reading, PA	40	20	75	56	0	+26	+22	+19	+17	+12
Redding, CA	40	35	122	24	3	+31	+27	+25	+23	+19
Richmond, VA	37	32	77	26	0	+40	+31	+25	+20	+11
Roanoke, VA	37	16	79	57	0	+51	+41	+35	+30	+20
Roswell, NM	33	24	104	32	2	+39	+23	+14	+ 5	+11
Rutland, VT	43	37	72	58	0	+ 3	+ 6	+ 8	+ 9	+12
Sacramento, CA	38	35	121	30	3	+34	+26	+22	+18	+ 9

City	North Latitude		West Longitude		Time Zone Code	Key Letters				
						A min.	B min.	C min.	D min.	E min.
Salina, KS.....	38	50	97	37	1	+58	+50	+46	+42	+34
Salisbury, MD.....	38	22	75	36	0	+31	+22	+18	+14	+5
Salt Lake City, UT.....	40	45	111	53	2	+49	+45	+43	+41	+38
San Antonio, TX.....	29	25	98	30	1	+100	+76	+52	+27	+3
San Diego, CA.....	32	43	117	9	3	+31	+14	+4	-5	-23
San Francisco incl. Oakland and San Jose, CA.....	37	47	122	25	3	+40	+29	+25	+20	+9
Santa Fe, NM.....	35	41	105	56	2	+39	+26	+19	+12	0
Savannah, GA.....	32	5	81	6	0	+68	+59	+40	+30	+12
Scranton-Wilkes Barre, PA.....	41	25	75	40	0	+23	+20	+19	+18	+15
Seattle-Tacoma-Olympia, WA.....	47	37	122	20	3	+6	+20	+26	+32	+46
Sheridan, WY.....	44	48	106	58	2	+14	+20	+23	+26	+33
Shreveport, LA.....	32	31	93	45	1	+58	+41	+31	+21	+3
Sioux Falls, SD.....	43	33	96	44	1	+38	+41	+43	+44	+47
South Bend, IN.....	41	41	86	15	0	+63	+62	+61	+60	+58
Spartanburg, SC.....	34	56	81	57	0	+65	+51	+43	+36	+22
Spokane, WA.....	47	40	117	24	3	-16	-1	+5	+12	+27
Springfield, IL.....	39	48	89	39	1	+23	+17	+14	+12	+6
Springfield-Holyoke, MA.....	42	6	72	36	0	+7	+6	+6	+6	+5
Springfield, MO.....	37	13	93	18	1	+46	+34	+29	+23	+12
St. Johnsbury, VT.....	44	25	72	1	0	-4	+1	+4	+6	+12
St. Joseph, MO.....	39	46	94	50	1	+44	+38	+35	+32	+26
St. Louis, MO.....	38	37	90	12	1	+29	+21	+17	+12	+4
St. Petersburg, FL.....	27	46	82	39	0	+84	+60	+46	+32	+8
Syracuse, NY.....	43	3	76	9	0	+18	+20	+20	+21	+23
Tallahassee, FL.....	30	27	84	17	0	+85	+65	+53	+41	+21
Tampa, FL.....	27	57	82	27	0	+83	+59	+46	+32	+8
Terre Haute, IN.....	39	28	87	24	1	+15	+8	+5	+2	-5
Texarkana, AR.....	33	26	94	3	1	+57	+41	+32	+23	+7
Toledo, OH.....	41	39	83	33	0	+52	+51	+50	+49	+47
Topeka, KS.....	39	3	95	40	1	+49	+42	+38	+35	+27
Traverse City, MI.....	44	46	85	38	0	+49	+55	+58	+61	+67
Trenton, NJ.....	40	13	74	46	0	+21	+17	+15	+12	+7
Trinidad, CO.....	37	10	104	31	2	+31	+19	+14	+8	-3
Tucson, AZ.....	32	13	110	58	2	+68	+50	+40	+29	+11
Tulsa, OK.....	36	9	95	60	1	+58	+46	+40	+33	+21
Tupelo, MS.....	34	16	88	34	1	+34	+19	+10	-2	-13
Vernal, UT.....	40	27	109	32	2	+40	+36	+34	+32	+27
Walla Walla, WA.....	46	4	118	20	3	-5	+5	+9	+14	+24
Washington, DC.....	38	54	77	1	0	+35	+28	+24	+20	+12
Waterbury-Meriden, CT.....	41	33	73	3	0	+10	+8	+7	+6	+4
Waterloo, IA.....	42	30	92	20	1	+25	+25	+25	+25	+26
Wausau, WI.....	44	58	89	38	1	+5	+12	+15	+18	+25
West Palm Beach, FL.....	26	43	80	3	0	+76	+50	+36	+21	-5
Wichita, KS.....	37	42	97	20	1	+60	+50	+45	+40	+30
Williston, ND.....	48	9	103	37	1	+47	+63	+70	+78	+94
Wilmington, DE.....	39	45	75	33	0	+27	+21	+18	+15	+9
Wilmington, NC.....	34	14	77	55	0	+51	+36	+27	+19	+4
Winchester, VA.....	39	11	78	10	0	+38	+32	+28	+25	+19
Worcester, MA.....	42	16	71	48	0	+3	+3	+3	+3	+3
York, PA.....	39	58	76	47	0	+31	+25	+23	+20	+14
Youngstown, OH.....	41	6	80	39	0	+43	+40	+38	+37	+34
Yuma, AZ.....	32	43	114	37	2	+81	+64	+54	+44	+27
Anchorage, AK.....	61	10	149	59	5	-58	-23	+13	+48	+83
Cordova, AK.....	60	33	145	45	5	-72	-38	-4	+30	+64
Fairbanks, AK.....	64	48	147	51	5	-80	-38	+4	+46	+88
Fort Randall, AK.....	55	10	162	47	6	-43	-19	+5	+29	+53
Fort Yukon, AK.....	66	34	145	16	5	-98	-53	-7	+39	+84
Juneau, AK.....	58	18	134	25	3	+11	+41	+71	+101	+131
Ketchikan, AK.....	55	21	131	39	3	+12	+36	+61	+85	+109
Kodiak, AK.....	57	47	152	24	5	-35	-6	+23	+52	+81
McGrath, AK.....	62	58	155	36	5	-43	-4	+35	+73	+112
Nome, AK.....	64	30	165	25	6	-69	-28	+14	+56	+97
Hilo, HI.....	19	44	155	5	5	+124	+82	+40	-3	-45

City	North Latitude		West Longitude		Time Zone Code	Key Letters				
						A min.	B min.	C min.	D min.	E min.
Honolulu, HI	21	18	157	52	5	+129	+90	+50	+11	- 29
Lanai City, HI	20	50	156	55	5	+127	+87	+47	+ 6	- 34
Lihue, HI	21	59	159	23	5	+133	+95	+57	+18	- 20

CANADA

Calgary, Alb.	51	05	114	05	2	+18	+35	+51	+68	+84
Edmonton, Alb.	53	34	113	25	2	+ 5	+26	+48	+69	+90
Halifax, N.S.	44	38	63	35	-1	+21	+25	+30	+34	+38
Montreal, Que.	45	28	73	39	0	- 2	+ 4	+10	+15	+21
Ottawa, Ont.	45	25	75	43	0	+ 7	+13	+19	+24	+30
St. John, N.S.	45	16	66	03	-1	+28	+34	+39	+45	+50
Saskatoon, Sas.	52	10	106	40	2	-16	+ 3	+21	+40	+58
Sydney, N.S.	46	10	60	10	-1	+ 1	+ 8	+16	+23	+30
Thunder Bay, Ont.	48	27	89	12	0	+49	+61	+72	+84	+95
Toronto, Ont.	43	39	79	23	0	+29	+31	+33	+36	+38
Vancouver, B.C.	49	13	123	06	3	+ 1	+14	+27	+40	+53
Winnipeg, Man.	49	53	97	10	1	+15	+29	+44	+58	+72

KILLING FROSTS AND GROWING SEASONS

Courtesy of National Climatic Center

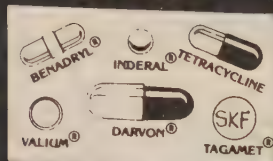
City	Growing Season (Days)	Last Frost Spring	First Frost Fall	City	Growing Season (Days)	Last Frost Spring	First Frost Fall
Montgomery, AL ...	279	Feb. 27	Dec. 3	St. Louis, MO	220	Apr. 2	Nov. 8
Little Rock, AR	244	Mar. 16	Nov. 15	Helena, MT	134	May 12	Sept. 23
Phoenix, AZ	317	Jan. 27	Dec. 11	Omaha, NE	189	Apr. 14	Oct. 20
Tucson, AZ	261	Mar. 6	Nov. 23	Reno, NV	141	May 14	Oct. 2
Eureka, CA	335	Jan. 24	Dec. 25	Concord, NH	142	May 11	Sept. 30
Los Angeles, CA	*	*	*	Trenton, NJ	211	Apr. 8	Nov. 5
Sacramento, CA	321	Jan. 24	Dec. 11	Albuquerque, NM ..	196	Apr. 16	Oct. 29
San Diego, CA	*	*	*	Albany, NY	169	Apr. 27	Oct. 13
San Francisco, CA ..	*	*	*	Raleigh, NC	237	Mar. 24	Nov. 16
Denver, CO	165	May 2	Oct. 14	Bismarck, ND	136	May 11	Sept. 24
Hartford, CT	180	Apr. 22	Oct. 19	Cincinnati, OH	192	Apr. 15	Oct. 25
Washington, D.C.	200	Apr. 10	Oct. 28	Toledo, OH	184	Apr. 24	Oct. 25
Miami, FL	*	*	*	Oklahoma City, OK ..	223	Mar. 28	Nov. 7
Macon, GA	252	Mar. 12	Nov. 19	Medford, OR	178	Apr. 25	Oct. 20
Pocatello, ID	145	May 8	Sept. 30	Portland, OR	279	Feb. 25	Dec. 1
Chicago, IL	192	Apr. 19	Oct. 28	Harrisburg, PA	201	Apr. 10	Oct. 28
Evansville, IN	216	Apr. 2	Nov. 4	Scranton, PA	174	Apr. 24	Oct. 14
Fort Wayne, IN	179	Apr. 24	Oct. 20	Columbia, SC	252	Mar. 14	Nov. 21
Des Moines, IA	183	Apr. 20	Oct. 19	Huron, SD	149	May 4	Sept. 30
Wichita, KS	210	Apr. 5	Nov. 1	Chattanooga, TN	229	Mar. 26	Nov. 10
Shreveport, LA	272	Mar. 1	Nov. 27	Del Rio, TX	300	Feb. 12	Dec. 9
New Orleans, LA	302	Feb. 13	Dec. 12	Midland, TX	218	Apr. 3	Nov. 6
Portland, ME	169	Apr. 29	Oct. 15	Salt Lake City, UT ...	202	Apr. 12	Nov. 1
Boston, MA	192	Apr. 16	Oct. 25	Burlington, VT	148	May 8	Oct. 3
Alpena, MI	156	May 6	Oct. 9	Richmond, VA	220	Apr. 2	Nov. 8
Detroit, MI	181	Apr. 25	Oct. 23	Spokane, WA	175	Apr. 20	Oct. 12
Marquette, MI	156	May 14	Oct. 17	Parkersburg, WV	189	Apr. 16	Oct. 21
Duluth, MN	125	May 22	Sept. 24	Green Bay, WI	161	May 6	Oct. 13
Minneapolis, MN	166	Apr. 30	Oct. 13	Madison, WI	177	Apr. 26	Oct. 19
Jackson, MS	248	Mar. 10	Nov. 13	Lander, WY	128	May 15	Sept. 20
Columbia, MO	198	Apr. 9	Oct. 24				

*Frosts do not occur every year.

The Side Effects of Prescription Drugs

You probably take drugs your doctor prescribes to feel better, to combat infection, to relieve pain, or to help you sleep. But drugs often cause side effects. This new, easy-to-understand book reveals the intended effects and undesirable side effects of each drug before you start taking your prescription. Here are just a few of the 200 drugs in this book listed in alphabetical order.

Prescription Drugs Effects & Side Effects



Interactions Side Effects
Money Saving Generic Names

Achromycin®	Chlor-Trimeton®	Equagesic®	Larotid®
Actifed®	Combidi®	Erythrocin®	Lasix®
Actifed-C	Erythromycin	Librax®	
Expectorant®	Compazine®	Esidrix®	Librium®
Aldactazide®	Cortisporin®	Fiorinal®	Lidex®
Aldactone®	Coumadin®	Fiorinal/Codeine®	Lomotil®
Aldomet®	Dalmane®	Lo Oval®	
Aldoni®	Darvocet®	Flagyl®	Macrodantin®
Amoxicillin	Darvon®	Gantisin®	Medrol®
Amoxil®	Demulen®	Haldol®	Mellaril®
Ampicillin	Diabinese®	Hydergine®	Meproamate
Antivert®	Digoxin	Hydrochloro-thiazide®	Minocin®
Apresoline®	Dilantin®	Monistat-7®	Motrin®
Atarax®	Dimetane®	HydroDiuril®	
Ativan®	Dimetapp®	Hydropres®	Mycolog®
Atromid-S®	Diuril®	Hygroton®	Naldecon®
Bactrim®	Donnatal®	Ilosone®	Naprosyn®
Benadryl®	Drixoral®	Inderal®	Neosporin®
Bendectin®	Dyazide®	Indocin®	Nitrobid®
Bentyl®	E.E.S.®	Inoamin®	Nitroglycerin
Benylin®	Elavil®	Isordil®	Nitrostat®
Butazolidin®	Empirin/Codeine®	Keflex®	Norgesic
Butisol®	E-Mycin®	Kenalog®	Forte®
Sodium Catapres®	Enduron®	Kwell®	Norinyl®
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			Ortho-Novum®
			Oval®
			Ovulen 21®
			Parafon Forte®
			Pavabid®
			Penicillin®
			Pen-Vee-K®
			Percodan®
			Periacin®
			Persantine®
			Phenaphen/Codeine®
			Phenergan/Codeine®
			Phenobarbital
			Poly-Vi-Flor®
			Prednisone
			Premarin®
			Provera®
			Pyridium®
			Quibron®
			Quinidine sulfate
			Regroton®
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			Ser-Ap-Es®
			Serax®
			Sinequan®
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			Sumycin®
			Synalgos-DC®
			Synthroid®
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			Talwin®
			Tenuate®
			Tetracycline
			Thorazine®
			Thyroid
			Tigan®
			Tofranil®
			Tolinase®
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			Triavil®
			Tuss-Ornade®
			Tylenol/Codeine®
			Valium®
			V-Cillin K®
			Vibramycin®
			Vistaril®
			Zyloprim®

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What started as roaring, clanking contraptions only their inventors could appreciate have become powerful tools for feeding the world.

by Charles McMurray

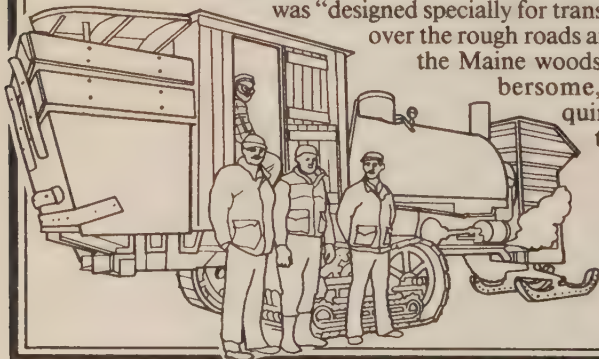
Title illustration by Chris Tremblay

Line drawings by Alison Scott

Just as animal power largely replaced human power in farming, mechanical power began to make its appearance on the farm in the last century. The story of how those first crude machines evolved into the modern agricultural tractor is a chronicle of the development of our country.

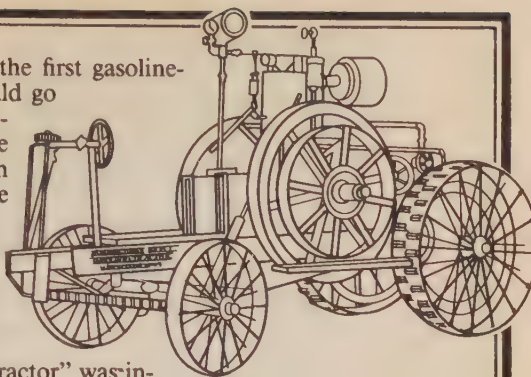
It was not uncommon to see horses working alongside steam-powered contraptions in the same fields from 1870 to 1920. The first steam engines were used to power stationary machines via connecting belts. Later, the engines were mounted on wheels or tracks and became self-propelling.

In the early 1890s, Alvin O. Lombard of Waterville, Maine, began to build commercial traction engines like the *Lombard Log Hauler*. Patented in 1901, it was "designed specially for transporting lumber and logs over the rough roads and even cross-country in the Maine woods." Enormous and cumbersome, such behemoths required two men to operate

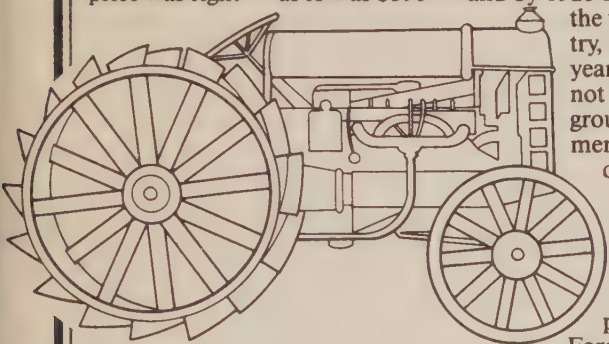


them: one to fuel and tend the boiler, the other to steer the machine. Despite these difficulties, they were well-received, especially in the flat farmlands of the West.

In 1892, John Froelich built the first gasoline-powered farm vehicle that could go backward and forward. His Waterloo Gasoline Traction Engine Company later became the John Deere Tractor Company we know today. The *Froelich* and subsequent early plowing tractors had great pulling power, but lacked speed and horsepower until the engines were improved. Incidentally, it was not until 1906 that the term "tractor" was invented by a salesman for the Hart-Paar tractor.

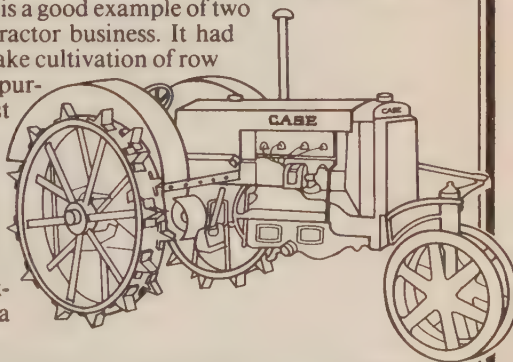


During World War I, when there was a shortage of farm labor and a tremendous demand for farm products, the time was ripe for increased tractor production. Henry Ford came along to fill the gap with his 1917 *Fordson*. The price was right — as low as \$395 — and by 1925 Ford owned more than half

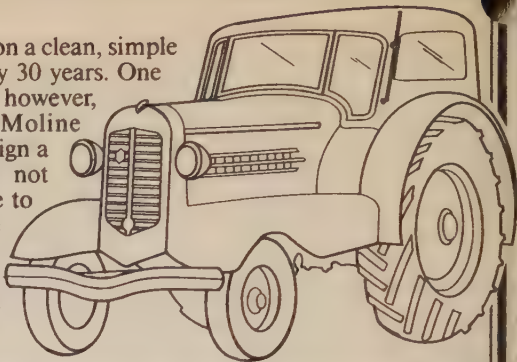


the tractor market in the country, selling 100,000 Fordsons a year. The reason his tractor was not called a Ford was that a group of Minnesota businessmen, taking clever advantage of the public knowledge that Henry Ford was developing a tractor, hired a young man named Ford and formed their own Ford Tractor Company. Only a few bogus Fords were ever built, however.

By 1930, in spite of the growing depression, more than 900,000 tractors were in use on U.S. farms — nearly double the number in 1925. The *Case Model CC* was introduced that year, and is a good example of two trends that were current in the tractor business. It had three wheels instead of four, to make cultivation of row crops easier, and it was a general-purpose tractor. Another idea just coming into vogue, though not in this model, was rubber tires, which gave farmers a smoother ride and more speed. Race driver Barney Oldfield about this time drove a rubber-tired tractor 64 mph, and once got a speeding ticket while driving a tractor through a small town in Indiana.

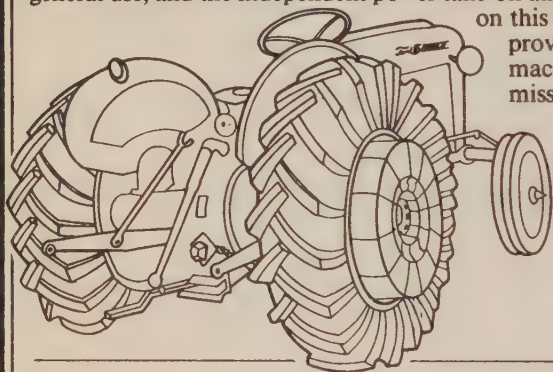


During the '30s, tractors took on a clean, simple appearance that lasted for nearly 30 years. One idea that was ahead of its time, however, came from the Minneapolis-Moline Company in 1938. Why not design a tractor that farmers could use not only to pull a plow, but to drive to town as well? The result was the *Comfortactor*, with streamlined automobile-style hood, headlights, an optional closed cab, and a top speed of 40 mph. Publicists had a field day with it, including posed pictures of couples in evening attire dismounting their *Comfortactor* in front of New York's Stork Club. But the farming community wasn't ready for the idea, and the *Comfortactor* didn't sell.



After building military tractors for the Army, the industry continued to upgrade tractors in the post-war years. Electric lights and ignitions came into general use, and the independent power take-off and three-point hitch (visible

on this *Ford 851*, circa 1958) improved the versatility of the machine. Sophisticated transmissions, shift-on-the-go, power steering, and even padded seats relieved the farmer of awkwardness and discomfort, and turbo-charged diesel engines began to replace their gas-powered predecessors, raising maximum horsepower to 150.



Today's farm tractors, like the 1974 *John Deere 8630*, would hardly be recognizable to the man who bought his *Fordson* in 1918. Sitting in the comfort of an air-conditioned cab, listening to his stereo tape-deck, the modern farmer might be found tooling along opening 16 furrows at speeds of up to six miles per hour. On the other hand, he might have to pay \$80,000 for that privilege. We've come a long way from the days of the Lombard Log Hauler. □□



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SURE PUTS OUT THE HEAT!

I purchased your single drum heater kit in 1977 and installed it in my house and now, 3 years later I am still using the same kit and the same barrel with no sign of any wear on either the barrel or the kit parts. With just a small amount of maintenance each spring I believe my stove will last for many years to come. I have looked at many other brands of stoves in other peoples houses since installing my Sotz heater and I can't see where any of them are more efficient than my Sotz, and many of them cost from \$300.00 to \$600.00. That barrel stove may not look as pretty as some of those "factory built" stoves but it sure puts out the heat!! Thanks again for making a fine product.

Paul Kuzman, Mars Hill, N.C.

TOTAL \$72. USED 79-80 WINTER

As an "Old Friend" of several years I think it's time I added my two bits to your collection of "Wood Burners Inc." This will be my 2nd year with a not so ugly stove. Since I had no use for the oil furnace, I used the case to enclose two 55 gal. drums and a 60 gal. tank from an electric water heater. By adding a fan from a range hood, connected to a thermostat I increased the gravity flow throughout a 5 bedroom home, 18' x 64'. I have arthritis and I need it at 70° or higher. Last year I used no oil and had all the hot water we ever needed, temp. of water at times was 145°. The year before I used 20 gallons of oil. I have used wood for 5 winters, my last oil was bought at 38¢ a gallon and that year my heating bill was \$420, with wood and all expenses of getting it. 79 and 80 winter was approx. \$72.00 and I used no electric for hot water from Nov. 23 to April 15.

John Kanarowski,
Germantown, Wisc.

LONG BURNING! AIR TIGHT!

I have received one of your excellent drum stove kits and I am very pleased with it. It is more efficient than a considerably more expensive stove that I have upstairs in my house. I have installed the stove in the basement and removed an old burning furnace . . . I am also very pleased with the heating capacity and the long burning feature. I have built drum stoves in the past from scratch for cabin heaters and tea stoves, but I have never seen a kit that goes together as easily as yours. In any event, I appreciate very much the quality and the well laid out instructions. We find that the stove burns all night easily on one load of dry alder. Even stopped down to almost complete air tight conditions it provides adequate warmth. Thank you very much for your excellent product.

L.L. Janke, Att. at Law
Portland, O.

ELIMINATES ELEC. HEATING

We are very pleased with our purchase of the Sotz double barrel kit (Sept. 1980). We have a 1½ story home with a full basement and approx. 2,000 sq. ft. of living area and heat the entire house with the kit located in the basement. The past winter we actually burned less fuel (approx. 4½ cords) compared to previous winters with a conventional type wood burner. The logs stay warmer longer and we actually have eliminated our electric heating system and still had an aver. temp. of 70° throughout the winter! We can only continue to tell people how totally satisfied we are with it. We heartedly recommend it to all who ask us about it and I feel you have probably received some sales as a result of our satisfaction with your product.

Gordon Bower, Estell Manor, N.J.

SOTZ HEATER MOST EFFICIENT

TEST RESULTS OF CONSUMER'S UNION

"THE HIGHEST EFFICIENCY of any of the stoves-better than 65 percent-and it worked well with small loads of wood. The stove's flue-gas temp. tended to stay moderately low, even with the air inlet fully open. (The inlet opening is small, apparently for safety reasons, since this huge stove could otherwise be dangerously overfired.) When closed, the inlet choked the fire effectively. The stove's wood capacity is enormous. The parts in the kit are of high quality". Consumer Report Oct. '81.

\$34.96

55 Gal.
bottom kit
factory
pick-up

\$28.95

30-Gal.
bottom kit
factory pick-up

	PRICE: DELIVERED TO YOUR DOOR	FACTORY PICK-UP
30-Gal. - Bottom	\$32.95	\$28.95
55-Gal. - Bottom	\$38.97	\$34.96
Top Kit fits both	\$20.97	\$17.96

(Drums Not Supplied)

* Guarantee: Our famous 1-year trial offer, 10 years against failure, plus, we have been in business 26 years to back it up.

* PATENTED INTERNAL DRAFT CHANNEL...
Air entering top draft control is preheated as it is drawn down inside of door; and is sucked into bottom of heater with a turbulent action, mixing with the wood gases. This makes the Sotz stove most efficient. Also, it's impossible for hot sparks to jump out of heater as in others with draft straight open to fire.

* Top drum kit squeezes 60% more BTU'S from heat normally lost up the chimney.

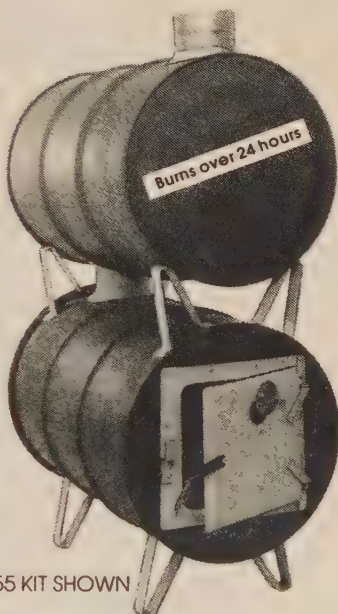
* Engineered to limit metal temp. of barrel to prevent burn up.

* Heavy all steel kit won't crack as poorly made cast iron imports with undersized door openings.

* 55 Gal. kit has a king-size 15½" diagonal opening for easy loading, less splitting of wood.

* 30 Gal. Sotz has bigger opening (9¼" Rnd.) than other brands' 55 gal. kits.

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OUTDOOR PLANTING TABLE, 1983

The best time to plant flowers and vegetables that bear crops above the ground is during the LIGHT of the moon; that is, between the day the moon is new to the day it is full. Flowering bulbs and vegetables that bear crops below ground should be planted during the DARK of the moon; that is, from the day after it is full to the day before it is new again. These moon days for 1983 are given in the "Moon Favorable" columns below. See pages 46-72 for the exact times and days of the new and full moons.

The three columns below give planting dates for the Weather Regions listed. (See Map p. 96.) Consult page 80 for dates of killing frosts and length of growing season. Weather regions 5 and South 16 are practically frost free.

Above Ground Crops Marked(*)	Weather Regions 1, 6, 9, 10, North 13		Weather Regions 2, 3, 7, 11, South 13, 15		Weather Regions 4, 8, 12, 14, 16	
E means Early L means Late	Planting Dates	Moon Favorable	Planting Dates	Moon Favorable	Planting Dates	Moon Favorable
*Barley	5/15-6/21	5/15-26, 6/10-21	3/15-4/7	3/15-28	2/15-3/7	2/15-27
*Beans (E)	5/7-6/21	5/12-26, 6/10-21	4/15-30	4/15-27	3/15-4/7	3/15-28
(L)	6/15-7/15	6/15-25, 7/10-15	7/1-21	7/10-21	8/7-30	8/8-23
Beets (E)	5/1-15	—	3/15-4/3	3/29-4/3	2/7-28	2/28
(L)	7/15-8/15	7/25-8/7	8/15-30	8/24-30	9/1-30	9/23-30
*Broccoli (E)	5/15-30	5/15-26	3/7-30	3/14-28	2/15-3/15	2/15-27, 3/14-15
(L)	6/15-7/7	6/15-25	8/1-20	8/8-20	9/7-30	9/7-22
*Brussels Spr.	5/15-30	5/15-26	3/7-4/15	3/14-28, 4/13-15	2/11-3/20	2/12-27, 3/14-20
*Cabbage Pl.	5/15-30	5/15-26	3/7-4/15	3/14-28, 4/13-15	2/11-3/20	2/12-27, 3/14-20
Carrots (E)	5/15-30	5/27-30	3/7-31	3/29-31	2/15-3/7	2/28-3/7
(L)	6/15-7/21	6/26-7/9	7/7-30	7/25-30	8/1-9/7	8/24-9/5
*Cauliflower (E)	5/15-30	5/15-26	3/15-4/7	3/15-28	2/15-3/7	2/15-27
Pl. (L)	6/15-7/21	6/15-25, 7/10-21	7/1-8/7	7/10-24	8/7-30	8/8-23
*Celery (E)	5/15-6/30	5/15-26, 6/10-25	3/7-30	3/14-28	2/15-28	2/15-27
(L)	7/15-8/15	7/15-24, 8/8-15	8/15-9/7	8/15-23, 9/6-7	9/15-30	9/15-22
*Corn, Sw. (E)	5/10-6/15	5/12-26, 6/10-15	4/1-15	4/13-15	3/15-30	3/15-28
(L)	6/15-30	6/15-25	7/7-21	7/10-21	8/7-30	8/8-23
*Cucumber	5/7-6/20	5/12-26, 6/10-20	4/7-5/15	4/13-27, 5/12-15	3/7-4/15	3/14-28, 4/13-15
*Eggplant Pl.	6/1-30	6/10-25	4/7-5/15	4/13-27, 5/12-15	3/7-4/15	3/14-28, 4/13-15
*Endive (E)	5/15-30	5/15-26	4/7-5/15	4/13-27, 5/12-15	2/15-3/20	2/15-27, 3/14-20
(L)	6/7-30	6/10-25	7/15-8/15	7/15-24, 8/8-15	8/15-9/7	8/15-23, 9/6-7
*Flowers	5/7-6/21	5/12-26, 6/10-21	4/15-30	4/15-27	3/15-4/7	3/15-28
*Kale (E)	5/15-30	5/15-26	3/7-4/7	3/14-28	2/11-3/20	2/12-27, 3/14-20
(L)	7/1-8/7	7/10-24	8/15-31	8/15-23	9/7-30	9/7-22
Leek Pl.	5/15-30	5/27-30	3/7-4/7	3/29-4/7	2/15-4/15	2/28-3/13, 3/29-4/12
*Lettuce	5/15-6/30	5/15-26, 6/10-25	3/1-31	3/14-28	2/15-3/7	2/15-27
*Muskmelon	5/15-6/30	5/15-26, 6/10-25	4/15-5/7	4/15-27	3/15-4/7	3/15-28
Onion Pl.	5/15-6/7	5/27-6/7	3/1-31	3/29-31	2/1-28	2/28
*Parsley	5/15-30	5/15-26	3/1-31	3/14-28	2/20-3/15	2/20-27, 3/14-15
Parsnips	4/1-30	4/28-30	3/7-31	3/29-31	1/15-2/4	1/29-2/4
*Peas (E)	4/15-5/7	4/15-27	3/7-31	3/14-28	1/15-2/7	1/15-28
(L)	7/15-30	7/15-24	8/7-31	8/8-23	9/15-30	9/15-22
*Pepper Pl.	5/15-6/30	5/15-26, 6/10-25	4/1-30	4/13-27	3/1-20	3/14-20
Potato	5/1-15	—	4/1-15	—	2/10-28	2/28
*Pumpkin	5/15-30	5/15-26	4/23-5/15	4/23-27, 5/12-15	3/7-20	3/14-20
Radish (E)	4/15-30	4/28-30	3/7-31	3/29-31	1/21-3/1	1/29-3/1
(L)	8/15-30	8/24-30	9/7-30	9/23-30	10/1-21	—
*Spinach (E)	5/15-30	5/15-26	3/15-4/20	3/15-28, 4/13-20	2/7-3/15	2/12-27, 3/14-15
(L)	7/15-9/7	7/15-24, 8/8-23, 9/6-7	8/1-9/15	8/8-23, 9/6-15	10/1-21	10/6-21
*Squash	5/15-6/15	5/15-26, 6/10-15	4/15-30	4/15-27	3/15-4/15	3/15-28, 4/13-15
*Swiss Chard	5/1-30	5/12-26	3/15-4/15	3/15-28, 4/13-15	2/7-3/15	2/12-27, 3/14-15
*Tomato Pl.	5/15-30	5/15-26	4/7-30	4/13-27	3/7-20	3/14-20
Turnips (E)	4/7-30	4/28-30	3/15-30	3/29-30	1/20-2/15	1/29-2/11
(L)	7/1-8/15	7/25-8/7	8/1-20	—	9/1-10/15	9/23-10/5
*Wheat, Winter	8/11-9/15	8/11-23, 9/6-15	9/15-10/20	9/15-22, 10/6-20	10/15-12/7	10/15-21, 11/4-20, 12/4-7
Spring	4/7-30	4/13-27	3/1-20	3/14-20	2/15-28	2/15-27



Gardening by the Moon's Sign

The Outdoor Planting Table on the opposite page shows how the phases of the moon have long been used as a guide for planting crops. But in addition to the general rules concerning the light and dark of the moon — by which that table is prepared — there is another ancient set of guidelines involving the moon's place in the Zodiac. Gardeners who use the moon's sign follow these rules: 1) Plant when the moon is in a fruitful, feminine sign: Cancer, Scorpio, Pisces, Taurus or Capricorn. 2) Cultivate when the moon is in a barren, masculine sign: Aries, Leo, Virgo, Sagittarius, Gemini, Libra and Aquarius.

There are specific activities best performed when the moon is in a certain sign: **Aries:** cultivating, plowing, tilling. **Taurus:** potatoes, root crops, lettuce, cabbage. **Gemini:** weeding, cultivating, destroying growths. **Cancer:** best sign for all planting and irrigating. **Leo:** use only for killing weeds. **Virgo:** good for cultivation. **Libra:** planting flowers, seeding hay and livestock feed. **Scorpio:** very productive for all planting, especially vines. **Sagittarius:** cultivation, planting onions, seeding hay. **Capricorn:** potatoes, tubers, root crops. **Aquarius:** weeding, destroying pests. **Pisces:** highly productive, especially for root growing.

MOON'S PLACE IN THE ZODIAC

	Nov 82	Dec 82	Jan 83	Feb 83	Mar 83	Apr 83	May 83	June 83	July 83	Aug 83	Sept 83	Oct 83	Nov 83	Dec 83
1	TAU	GEM	LEO	VIR	LIB	SCO	SAG	AQU	PSC	ARI	GEM	CAN	VIR	LIB
2	TAU	GEM	LEO	LIB	LIB	SAG	CAP	AQU	PSC	TAU	GEM	LEO	LIB	SCO
3	TAU	CAN	VIR	LIB	SCO	SAG	CAP	PSC	ARI	TAU	CAN	LEO	LIB	SCO
4	GEM	CAN	VIR	SCO	SCO	SAG	AQU	PSC	ARI	GEM	CAN	VIR	LIB	SAG
5	GEM	LEO	VIR	SCO	SCO	CAP	AQU	PSC	ARI	GEM	LEO	VIR	SCO	SAG
6	CAN	LEO	LIB	SAG	SAG	CAP	AQU	ARI	TAU	CAN	LEO	LIB	SCO	CAP
7	CAN	VIR	LIB	SAG	SAG	AQU	PSC	ARI	TAU	CAN	VIR	LIB	SAG	CAP
8	LEO	VIR	SCO	SAG	CAP	AQU	PSC	TAU	GEM	LEO	VIR	SCO	SAG	CAP
9	LEO	LIB	SCO	CAP	CAP	AQU	ARI	TAU	GEM	LEO	LIB	SCO	CAP	AQU
10	VIR	LIB	SAG	CAP	CAP	PSC	ARI	GEM	CAN	VIR	LIB	SAG	CAP	AQU
11	VIR	LIB	SAG	CAP	AQU	PSC	ARI	GEM	CAN	VIR	SCO	SAG	CAP	PSC
12	LIB	SCO	SAG	AQU	AQU	ARI	TAU	CAN	LEO	LIB	SCO	SAG	AQU	PSC
13	LIB	SCO	CAP	AQU	PSC	ARI	TAU	CAN	LEO	LIB	SAG	CAP	AQU	PSC
14	SCO	SAG	CAP	PSC	PSC	TAU	GEM	LEO	VIR	SCO	SAG	CAP	PSC	ARI
15	SCO	SAG	AQU	PSC	PSC	TAU	GEM	LEO	VIR	SCO	CAP	AQU	PSC	ARI
16	SCO	CAP	AQU	ARI	ARI	TAU	CAN	VIR	LIB	SCO	CAP	AQU	PSC	TAU
17	SAG	CAP	AQU	ARI	ARI	GEM	CAN	VIR	LIB	SAG	CAP	AQU	ARI	TAU
18	SAG	CAP	PSC	ARI	TAU	GEM	LEO	VIR	SCO	SAG	AQU	PSC	ARI	TAU
19	CAP	AQU	PSC	TAU	TAU	CAN	LEO	LIB	SCO	CAP	AQU	PSC	TAU	GEM
20	CAP	AQU	ARI	TAU	GEM	CAN	VIR	LIB	SAG	CAP	PSC	ARI	TAU	GEM
21	CAP	AQU	ARI	GEM	GEM	LEO	VIR	SCO	SAG	CAP	PSC	ARI	GEM	CAN
22	AQU	PSC	ARI	GEM	GEM	LEO	LIB	SCO	SAG	AQU	PSC	ARI	GEM	CAN
23	AQU	PSC	TAU	CAN	CAN	VIR	LIB	SAG	CAP	AQU	ARI	TAU	CAN	LEO
24	PSC	ARI	TAU	CAN	CAN	VIR	LIB	SAG	CAP	PSC	ARI	TAU	CAN	LEO
25	PSC	ARI	GEM	LEO	LEO	LIB	SCO	SAG	AQU	PSC	TAU	GEM	CAN	VIR
26	PSC	TAU	GEM	LEO	LEO	LIB	SCO	CAP	AQU	PSC	TAU	GEM	LEO	VIR
27	ARI	TAU	CAN	VIR	VIR	SCO	SAG	CAP	AQU	ARI	TAU	CAN	LEO	LIB
28	ARI	GEM	CAN	VIR	VIR	SCO	SAG	AQU	PSC	ARI	GEM	CAN	VIR	LIB
29	TAU	GEM	LEO	—	LIB	SCO	CAP	AQU	PSC	TAU	GEM	LEO	VIR	SCO
30	TAU	CAN	LEO	—	LIB	SAG	CAP	AQU	ARI	TAU	CAN	LEO	LIB	SCO
31	—	CAN	VIR	—	SCO	—	CAP	—	ARI	GEM	—	VIR	—	SAG

Just Plant 'Em—Stake 'Em—Tie 'Em—Pick 'Em! See

Now! GIANT MAN-HIGH STRAWBERRIES!

SO BIG AND JUICY—JUST A SINGLE SLICED-UP BERRY TOPS AN ENTIRE BOWL OF CEREAL!



Red Rocket Strawberry is the trade name for Hecker Variety, developed by Calif. University plant scientists, Davis, Calif. And of course, all claims are based on optimum growing conditions. All orders shipped for proper planting time in your area.

Yes, it's true! Recently released by Calif. University Plant Scientists . . . a brand new wonder-hybrid that you simply grow on a trellis, pole, fence or side of your house . . . and be absolutely amazed as you train it to 'polevault' high as a man . . . loaded down with teeming clusters of fruit . . . **THIS VERY SEASON!**

WHO EVER HEARD OF PICKING STRAWBERRIES BY REACHING OUT YOUR WINDOW

Here's one of the most spectacular sights of all of nature. Guaranteed to bring traffic to a screeching halt in front of your house this very season! As these wondrous "RED ROCKET" strawberries . . . roar forth into a man-high 'berry-factory', simply loaded with teeming bowlfuls of the most meaty, sugar-packed taste-treats you've ever sunk a tooth into. When you'll pick 'em by the pintful this very summer—thanks to the most outrageous outpouring of fruit imaginable.

**A LIVING STRAWBERRY WATERFALL!
SIMPLY PLANT THEM—STAKE THEM—
TRAIN THEM—TIE THEM—
SEE 'EM ZOOM HIGH AS
A MAN IN A SINGLE SEASON!**

Yes, unlike regular strawberries that you grow on the ground . . . you simply plant these wonder plants smack in the middle of any garden—fence—trellis—side of your house or garage—why even a drainpipe or a plain old clothesline pole and thrill to see them erupt in massive cascading sprays of fruit like a whole 'strawberry farm' marching up and down waves of luscious fruit!

Can't you just see the looks of amazement on your neighbors' faces when you invite them to dinner . . . and tell them to reach out of your

Man Rocket Forth In A Cluster-Packed Pillar of Fruit!

dining room window to pick their own luscious strawberry dessert right off the vine! And not some skimpy little berries . . . but sugar-packed giants SO HUGE AND MEATY, they're virtually impossible to circle with the fingers of one hand . . . YOU ACTUALLY NEED TWO!

IN FACT—BERRIES SO BIG YOU CAN BARELY SQUEEZE MORE THAN ONE IN YOUR MOUTH AT A TIME!

Yes, these 'Red Rocket' Strawberries are so eager to grow—so desperate to produce . . . you'll drape your walls, trellises, fences in cascading fountains of fruit . . . as these man-high beauties reward you with the most incredible parade of "MAN-HIGH" fruit, flowers and foliage you've ever seen in your life. Yes, teaming bowlfuls of sugar-packed beauties:

■ SO BIG & JUICY—

Just one berry makes a spoonful!

■ SO HUGE & MEATY—

Just a single sliced up berry makes a whole strawberry tart . . . and 5 or 6 make a whole strawberry shortcake!

■ SO FAST-GROWING—

they flare out in a man-high column of fruit as they stream up and down your fences and trellis in a 6 foot tower of fruit, flowers and foliage.

AND THEY MULTIPLY—SO YOU GET UP TO TWICE AS MANY EACH AND EVERY YEAR!

And remember—because these 'RED-ROCKET' strawberries multiply, when you follow the easy growing instructions, for every berry-laden, man-high vine you grow this year, you'll still get more next year . . . and still more new plants for years to come. Meaning: berries by the bowlful year after year after year!

ACT NOW! THE SOONER YOU PLANT THEM, THE SOONER YOU'LL ENJOY THESE MAN-HIGH STRAWBERRIES!

Here's the best news of all—the amazing price of these wondrous 'MAN-HIGH' strawberries. Not the \$1 or \$2 per plant you might expect for such a remarkable super-bearer . . . but less than 50¢ apiece for thickly-rooted nursery-grown plants . . . and each one all set to reward you with a man-high column of fruit this very season.

But one word of caution—with an incredible wonder-fruit release like this, demand is bound to be overwhelming. To avoid disappointment, act now!



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Westbury, N.Y. 11590

Please send me in proper planting time in my area, the GIANT 'RED ROCKET' Strawberry Plants checked below. I must be completely satisfied or my money will be refunded in full (less postage & handling, of course).

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- ☐ (#012) 12 'RED ROCKET' PLANTS only \$4.98 plus 75¢ postage & handling.
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Div. Willow River Nursery Sales, Inc.

The Most Valuable Tree in America

The worldwide demand for black walnut wood, particularly for veneers, is so great that it is realistic to consider planting these trees now for lumber in 40 to 60 years!

by Mark Mikolas

illustrated by Carl Kirkpatrick

□ THERE ARE REPORTS THAT A single tree has brought \$11,000. Hardwood hunters (and fortune hunters) search the woods for similar trees. When they are found, no photos are taken, no names are mentioned, and the location is kept secret — especially valuable trees have had a way of disappearing in the middle of vacations.

Sailing up the Hudson 300 years ago, the Dutch discovered virgin stands of black walnut trees so large that the first branch was often as much as 70 feet above the ground. Even then the wood was so highly prized among cabinet-makers that black walnut — in addition to being fed into colonial New England sawmills — became one of America's first exports.

Because the wood from these virgin giants grew slowly, the grain was very tight; antiques made of black walnut seem to be made of an entirely different wood from the furniture made of today's black walnut.

By World War I almost all natural stands had been decimated. Trees were being harvested for gunstocks and the nutshells were being collected by Boy Scouts and ground up for use as a filtering material in gas masks.

Today the prices being paid worldwide for black walnut, especially in veneer form (thin sheets peeled from rotating logs), make the planting of black walnut trees economically attractive. Bruce Thompson in his book *Black Walnut for Profit* estimates that 10 acres planted today and knowledgeably cared for will be worth about a million dollars in the 40 to 60 years they will take to mature.

But the best grain patterns and color

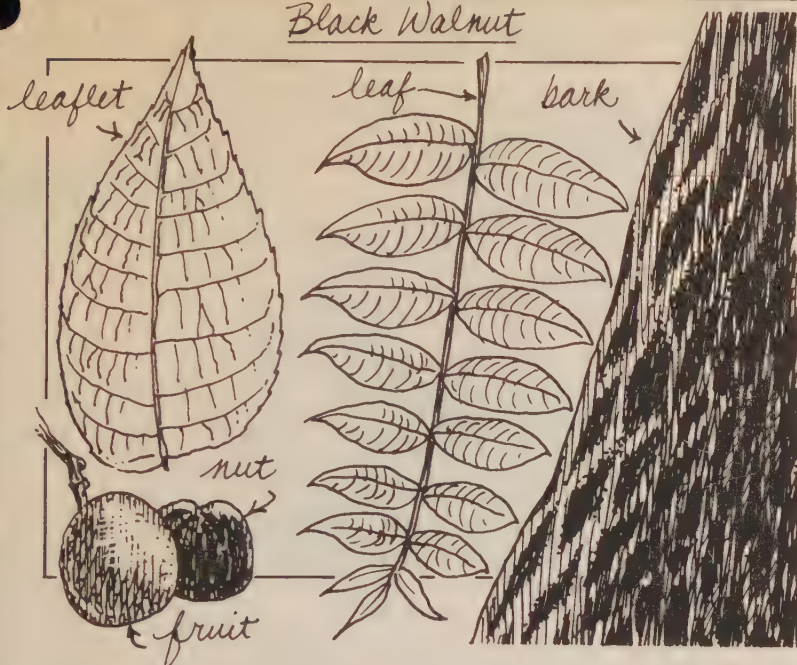
do not come from fast-growing farmed trees, many of which are in the mid-Eastern states. Rather, the slower-growing trees of the Northeast — and especially of the Hudson Valley into Connecticut — bring the best prices and provide the richest color, most beautiful grain, and highest quality lumber and veneer.

Hardwood buyers still scour the countryside looking for perfect specimens to be made into black walnut veneer. Peter Parzuchowski, a major hardwood buyer in Connecticut, seeks out old black walnut trees by studying George Washington's campaigns. The soldiers of the Revolution carried black walnuts for snacks, and prime specimens may now stand along the marches where nuts were accidentally dropped.

There is only a slim chance that one's dooryard black walnut could command a price that would raise a new barn. Herbert Hooks, a hardwood buyer based in Hockessin, Delaware, cautions against gold-rush fever. "There are so many factors involved that make a tree valuable," he explains. "We have scouts in every state on the Eastern seaboard from Vermont to North Carolina and west to Ohio. In a year's time we average about four logs that we classify as 'super super sticks' or unusually valuable trees."

Though chances are extremely slim that a black walnut tree is worth a considerable amount of money, it is not impossible. However, there are several minimum qualifications a tree must meet before it is even worth having appraised: it must have a circumference of at least 100 inches at eye level; it must be in excellent health; and it must

Black Walnut



be absolutely free of branches or defects for at least 10 feet.

In addition, it must be located where there is little chance that any metal has ever been embedded in it. For instance, a tree standing alone in a field is almost certainly full of 80 years of gunshot. During its lifetime, a tree near a house has probably grown around and sealed inside scores of bolts, hooks, and clothesline fixtures. Such trees are almost immediately disqualified from consideration. Often a buyer will actually have a tree x-rayed before he hands over a large check for it.

Before calling a hardwood buyer to inspect a tree, call your local state forestry office or a private forester to have it examined. If your tree meets the above specifications and a professional forester agrees, then contact a buyer if you are seriously interested in selling.

If the notion of planting black walnuts appeals to you, get expert information on required soil conditions, light, weed control, pruning, and thinning. Such information is available

through the U.S. Forest Service. Without thorough knowledge of where and how to plant black walnuts, you are bound to have disappointing results.

The roots of black walnut produce a toxin called *juglone* that adversely affects a number of plants, including pines, tomatoes, potatoes, blackberries, alfalfa, and apples. If you have a tree, take care to plant your garden elsewhere.

Two characteristics make it easy to identify a black walnut tree: it is one of the last trees to sprout leaves in the spring and one of the first to lose them in the fall. At these times a bare tree — when others are in leaf — may very well be a black walnut.

There are three additional tip-offs:

- The pattern of the roughly corrugated bark is diamond-shaped. The bark on young trees is silvery and darkens with age.

- Black walnut leaves have seven to 17 narrow-toothed leaflets.

- Green nuts are well formed by mid-July.

□ □

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FOR YOUR MONEY!**



**Model 910 shown
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The Model 910 is a most practical size for more produce out of your garden space. The 16" tilling width is the same as the world-famous Howard Rotovator, and NOW the largest competitor has new narrower machines.

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4. Most all parts made by Roto-Hoe, including wheels, throttle control, and belt idler. Better design and quality; lower cost.
5. Tecumseh 5 H.P. large frame engine; over 13,000 Tecumseh service outlets.
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Also aerating attachment or discs for tiller. Wider Model 990, 6 or 8 H.P.; 8 H.P. approximately \$800.00

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Gentlemen: Please send me information on your tiller and attachments.

Name

Address

City State Zip

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Performance
and Value*



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3. Grate bars are standard on discharge to minimize clogging of damp material. Screens are optional; ALSO CATCHER PAN.
4. Sold as a complete unit, or as an attachment for Roto-Hoe tillers.
5. Built with heavy gauge steel; (no replacement of main frame in 20 years of manufacture); Timken roller bearings on rotor shaft for your assurance of quality; plus heat treated wearing parts.
6. Sold through factory direct dealers, or direct to consumer if there is no dealer in your area.
- *7. Model 500-H shown with 10" and 12" wheels, towing bar handle, 5 H.P. engine, just \$389.00 with partial freight allowance. This model can be had with rigid tines at \$40.00 less. With a 3½ H.P. engine you may deduct \$30.00 more, for a net price of \$319.00.

THE ROTO-HOE COMPANY
Dept. OFA, Newbury, OH 44065

Gentlemen: Please send me information
on your shredders and tillers.

Name _____

Address _____

City _____ State ____ Zip ____



GENERAL WEATHER FORECAST 1982-1983

(For details see regional forecasts beginning on page 98.)

November through March: Winter east of the Rockies will be particularly severe after the beginning of the new year. Prolonged and severe cold waves through January and early February and again in the latter part of March should result in a colder and snowier winter overall, but with below-average amounts of precipitation. November may start out cold and wet with snow in north-central and mountain sections of the Northeast. After that, relatively dry conditions should prevail until Christmas, with December anticipated to be sunnier and milder than usual, with drought in the western Great Plains. A moderate snowstorm and cold snap the final week of December will usher in more severe winter weather, with periods of below-average temperatures. At the end of January a blizzard and severe cold wave may extend well into the South and to the Atlantic Coast. After the first week of February, some respite from the cold is anticipated, but several cold waves in March will make it a cold month, while frequent snowstorms in both months will bring above-normal amounts of snow.

The **Rockies and West** are expected to have a mild winter, with precipitation alternating between dry and wet months and with the snowfall below normal in northern and southern sections, but above normal in central sections, particularly through January and February. A warm and dry November may result in serious drought in many sections, but relief should materialize in west-central and northwestern sections in December, with most of the precipitation in the form of rain. A snowstorm and cold wave at the end of the year should bring a return to more seasonable weather. Storms in January, February, and early March will bring above-normal amounts of precipitation, except in desert areas, and above-average snowfall to elevated sections.

April through October: The first half of April in the eastern part of the country is expected to be mild and wet, with considerable flooding, particularly in the Middle Atlantic section. Cool and wet weather may delay spring by two to three weeks. Below-average precipitation may occur in the central and northern Great Plains and in Florida in the latter part of April. May will be variable; precipitation may be deficient in central and southern sections, but above average in northern ones. June will be variable with frequent thunderstorms and large deviations from normal temperatures. Deficient precipitation is anticipated for the western Great Plains, Central Atlantic region, and southern Great Lakes.

Spring in the **Rockies and West** is expected to be warmer and drier than usual in southern sections, but quite wet initially in the north and northwest with possible floods in Central Valley of California during the first half of April. Thereafter, generally above-average temperatures and below-average precipitation should prevail, with an unusual heat wave in the latter part of June. The summer should be warmer than average from the Rockies west and in the northern Great Plains, but cooler than average elsewhere. A major heat wave during the last week of July may extend into August. Thundershowers will bring above-average rainfall to the Northeast, the Ohio River valley, and south-central sections in July, with flooding in the South Atlantic states late in August. The eastern Great Lakes, Northeast, and the Middle Atlantic regions will have cool and wet weather in September, while the South and southern Great Lakes will have below-average rainfall. Warm and dry weather is expected in the South Atlantic section and Great Plains; in the West warm and wet conditions will prevail. October will be drier than normal east of the Rockies and wetter west.

Ed. Note: As we go to press on July 1, 1982, the possible effects on our 1983 weather by the eruption of the Mexican volcano, El Chichon, on April 4, 1982, are yet to be fully assessed. Therefore, our 1983 weather forecasts do not take these possible effects into account.

1. NEW ENGLAND

For regional boundaries, see map p. 96.

SUMMARY: Look for the winter as a whole to be colder than average, with snowfall about normal, although lighter than normal through January and heavier than normal thereafter. November will be colder and drier than usual, with an occasional milder spell. Except for a cold snap at mid-month, December is expected to be mild until Christmas, but then to turn very cold. January will be cold except for a thaw the third week. After mid-February, heavier than usual amounts of snow may be expected. After a cold first week, February temperatures should be mild, followed by a cold and wet March with above-normal snowfall in the north. Warmer weather is expected the first half of April, with persistent cold the last half, and above-normal precipitation. May will begin sunny and warm, but turn cold and rainy, with generally deficient rainfall in the south. June will be warm. A cool spell will begin the last week and persist well into July. Hot weather will dominate mid-July; the end of the month, and the first few days of August. Showers through July and the first week of August will bring above-normal rainfall, but it will be quite dry through the balance of August, September, and October, except for the last week of September. Temperatures during this period will be seasonal, except for several cool spells.

Nov. 1982: Temp. 40° (5° below ave.); Precip. 4.5" (Ave.; 1" below north). 1-2 Cloudy & cold. 3-5 Heavy rain, cold. 6-8 Partial clearing. 9-12 Rain south, then clearing. 13-16 Sleet, then light rain. 17-20 Cold, snow north. 21-23 Sunny & mild. 24-26 Cold, flurries. 27-30 Cloudy, cold.

Dec. 1982: Temp. 34° (1° above ave.; 2° above north); Precip. 2.5" (1" below ave.). 1-5 Clearing & mild. 6-8 Rain. 9-11 Cloudy & seasonal. 12-15 Sleet south, snow north; cold. 16-20 Cold, snow; clearing. 21-23 Sleet, mild. 24-26 Rain changing to snow. 27-31 Cold, cloudy; snow north.

Jan. 1983: Temp. 24° (5° below ave.); Precip. 2.5" (1" below ave.). 1-2 Clear & cold. 3-4 Snowstorm. 5-8 Cloudy & cold. 9-12 Flurries. 13-15 Clear & very cold. 16-19 Snow then heavy rain, thaw. 20-23 Cold, cloudy; flurries south. 24-27 Partial clearing, snow north. 28-31 Light snow, cold.

Feb. 1983: Temp. 30° (Ave.; 2° above coast); Precip. 4.5" (1" above ave.; ave. west). 1-5 Clearing, warming. 6-9 Partly cloudy & cold. 10-13 Sleet, snow mountains. 14-17 Rain south & coast, snow north; colder. 18-19 Nor'easter, heavy central & south; cold. 20-22 Clear. 23-25 Snowstorm, colder. 26-28 Clear & cold.

Mar. 1983: Temp. 32° (6° below ave.); Precip. 3.5" (0.5" below ave.). 1-4 Flurries, cold. 5-8 Clear, cold. 9-13 Heavy rain & snow, milder. 14-18 Cold, snow north. 19-21 Snowstorm, rain coast. 22-26 Rain coast, snow inland. 27-31 Partly cloudy, cold.

April 1983: Temp. 44° (4° below ave.); Precip. 5" (1.5" above ave.). 1-3 Cloudy & cold, flurries. 4-6 Rain, mild. 7-10 Colder, then rain. 11-12 Cloudy & cold. 13-16 Rain, cold, then clear & mild. 17-18 Rain, snow mountains, cold. 19-24 Partial clearing, then rain. 25-30 Rain, cold; clearing.

May 1983: Temp. 56.5° (2° below ave.; 0.5° above north); Precip. 2" (1.5" below ave.; 0.5" above north). 1-3 Showers, seasonable. 4-6 Clear & warm. 7-9 Rain, cool. 10-14 Few showers, mild. 15-19 Sunny, cool. 20-22 Rain. 23-25 Clearing & warm. 26-31 Cold & rainy.

June 1983: Temp. 65° (3° below ave.; ave. north); Precip. 3" (Ave.). 1-3 Rain, cooler. 4-6 Heavy rain south, cool. 7-10 Showers, warm. 11-13 Cloudy, warm. 14-16 Rain, cool. 17-20 Sunny, few showers, warm. 21-23 Clear. 24-26 Rain, turning cool. 27-30 Clear, then rain.

July 1983: Temp. 70° (3° below ave.); Precip. 4" (1" above ave.). 1-5 Rain, heavy inland; cool. 6-8 Showers, mild. 9-11 Rain, cool. 12-15 Clear & hot. 16-18 Rain, cool. 19-21 Clearing, then showers. 22-24 Sunny & warm. 25-27 Thundershowers. 28-31 Clearing, hot.

August 1983: Temp. 70° (1° below ave.; 1° above inland); Precip. 1.5" (2" below ave.; 0.5" below inland). 1-4 Clear & hot, then rain. 5-7 Cloudy & cool. 8-10 Sunny & warm. 11-16 Showers, then clear & warm. 17-19 Sprinkles, mild. 20-22 Clear, hot. 23-27 Thundershowers, cool. 28-31 Rain, cool.

Sept. 1983: Temp. 64.5° (Ave.); Precip. 2.5" (0.5" below ave.; 1" above north). 1-3 Sunny & mild. 4-7 Showers, warm. 8-10 Partial clearing. 11-15 Rain, cool. 16-19 Gradual clearing. 20-25 Showers, then sunny & hot. 26-30 Rain, warm.

Oct. 1983: Temp. 51.5° (4° below ave.); Precip. 0.5" (2.5" below ave.; ave. northwest). 1-5 Sunny; cold nights. 6-8 Cloudy; showers south. 9-12 Clear. 13-15 Rain, cool. 16-19 Clearing & mild. 20-22 Rain, snow mountains. 23-27 Cold, some sleet. 28-31 Mild.

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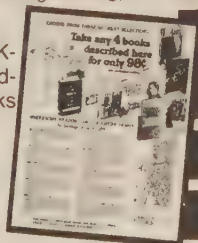
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2. GREATER NEW YORK-NEW JERSEY

For regional boundaries, see map p. 96.

SUMMARY: *Prolonged cold and heavy snows after the new year should bring temperatures well below normal and total snowfall to about average, despite the winter as a whole having less than normal precipitation. Cold spells during the first ten days and the last week of November are expected to more than balance a possible mild spell the third week. December will have warm spells right up until Christmas to give a generally mild month until the last week. January should see prolonged cold through the month and continuing during the first week of February, with a brief mild spell just after mid-January. Snowfall should be slightly below average through January, with a major snowstorm just after mid-February. Two storms of rain mixed with snow in March will bring February and March above-average snowfall. A cool and wet second half of April, with some snow in northern sections during the third week, will delay spring. May is expected to be closer to average in both temperature and precipitation. Northern sections will be cooler and wetter at the beginning and end of the month. The summer is expected to be cooler than usual, with a hot and humid period at the end of July and first week of August. Cool periods are anticipated the second week of July and the last half of August. Rainfall should be close to average and largely associated with thundershowers. Look for a possible heavy storm due to an offshore tropical storm early in September. After mid-September, cold spells will generally persist for longer periods than the warm ones, and it will be drier than normal.*

Nov. 1982: Temp. 42° (5° below ave.); Precip. 3.5" (0.5" below ave.). 1-2 Clear & mild. 3-5 Rain, cold. 6-8 Partly sunny, cold. 9-11 Rain; snow north. 12-14 Clearing, cold. 15-18 Cloudy & cold. 19-23 Clear & mild. 24-26 Light snow. 27-30 Mild, then very cold.

Dec. 1982: Temp. 38° (1° above ave.; 3° above south); Precip. 1" (2.5" below ave.; 1" below south). 1-4 Partly sunny. 5-7 Rain, mild. 8-12 Cloudy & cold, then showers. 13-15 Showers, mild. 16-18 Cold; freezing rain & snow north. 19-23 Clearing, mild. 24-26 Cold; rain & snow. 27-31 Cold; snow.

Jan. 1983: Temp. 26° (6° below ave.); Precip. 2.5" (0.5" below ave.). 1-4 Cold, then snow. 5-9 Cold, flurries. 10-12 Cold, snow. 13-15 Partial clearing, colder. 16-19 Heavy rain, sleet, & snow. 20-23 Cold snap, snow. 24-26 Partial clearing & warming. 27-31 Cloudy, cold.

Feb. 1983: Temp. 33.5° (Ave.; 1° below south); Precip. 3" (Ave.). 1-4 Clearing & warming. 5-9 Partly sunny, cold; snow north. 10-16 Rain, then clearing. 17-19 Blizzard, cold. 20-22 Clearing & cold. 23-25 Rain, snow mountains. 26-28 Partly sunny & seasonable.

Mar. 1983: Temp. 35° (6° below ave.); Precip. 4" (Ave.). 1-4 Cold, snow. 5-7 Cloudy, cold. 8-10 Rain & sleet. 11-14 Partly cloudy, seasonable. 15-18 Cold wave, sunny. 19-21 Rain mixed with snow; cold. 22-26 Sunny & mild, showers. 27-31 Very cold.

Apr. 1983: Temp. 46.5° (5° below ave.); Precip. 6" (2" above ave.). 1-5 Seasonable, rain. 6-9 Partly sunny, then rain. 10-12 Clear, warm. 13-15 Rain, cool. 16-18 Rain, cold, possible snow. 19-22 Cloudy, seasonable. 23-27 Rain, cold. 28-30 Clearing.

May 1983: Temp. 60° (3.5° below ave.); Precip. 3" (0.5" below ave.). 1-3 Cool, showers. 4-6 Clear & warm. 7-9 Rain, warm. 10-13 Clear, warm. 14-16 Rain, cool. 17-19 Sunny & warm, sprinkles. 20-22 Rain, cool. 23-25 Clear & warm. 26-31 Rain, cool.

June 1983: Temp. 68° (3° below ave.; 1° below south); Precip. 5" (2" above ave.; 2" below south). 1-2 Rain north. 3-7 Cool, then rain. 8-13 Sunny & hot. 14-16 Rain, cool. 17-21 Sunny, warm, few sprinkles. 22-24 Cool, rain north. 25-28 Clear & cool. 29-30 Rain north, sprinkles south, cool.

July 1983: Temp. 73° (3° below ave.); Precip. 4" (Ave.). 1-3 Rain, warm. 4-7 Cool, few showers. 8-10 Rain, cool. 11-15 Sunny, hot. 16-18 Showers, cool. 19-22 Sunny, few showers, cool. 23-26 Sunny & hot. 27-31 Showers, hot & humid.

Aug. 1983: Temp. 73.5° (2° below ave.); Precip. 3.5" (1" below ave.). 1-5 Hot & humid, scattered showers. 6-9 Partly cloudy, cool. 10-12 Rain, warm. 13-17 Sunny, seasonable. 18-21 Partly cloudy, showers, mild. 22-24 Rain, cool. 25-28 Sunny & mild. 29-31 Rain, turning cool.

Sept. 1983: Temp. 67° (2° below ave.); Precip. 4.5" (1.5" above ave.). 1-4 Rain, cool. 5-7 Possible offshore tropical storm. 8-13 Clear, mild. 14-16 Rain, cool. 17-21 Cloudy, cool. 22-24 Clear & warm. 25-27 Sunny, hot. 28-30 Mild, thundershowers.

Oct. 1983: Temp. 54° (4° below ave.); Precip. 1.5" (1.5" below ave.). 1-4 Sunny, cool. 5-7 Rain, cool. 8-12 Sunny & mild. 13-15 Rain. 16-20 Clear. 21-23 Cloudy & cold. 24-26 Rain, cold, snow mountains. 27-29 Clear & mild. 30-31 Cool, showers.

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3. MIDDLE ATLANTIC COASTAL

For regional boundaries, see map p. 96.

SUMMARY: *The winter should be significantly colder than usual, particularly after the new year, with below-normal precipitation, but with heavy snows in January and February bringing greater than average snowfall. Cold waves will chill the first part of November and the last week, and it should be fairly dry into December after a storm in the second week of November. December will be milder and drier than usual, followed by persistent cold from the new year through the first week of February. January snowfall should be greater than usual with a possible blizzard the last week, followed by a snowy February. Northern sections will have above-average snowfall in March as well. Fairly severe cold waves during the latter part of March will bring the monthly value below average. Wet weather during the first half of April may cause floods, and cold periods may delay spring for two to three weeks. More favorable conditions are expected in May. Hot spells in mid-June will compensate for a cool beginning and end, and frequent thundershowers are expected. Summer is anticipated to be cooler than average, with hot and humid periods the last week of July and first week of August. Thundershowers are expected to bring above-average amounts of rainfall, with some flooding in southeastern sections in late August. Cooler than average weather will persist through most of September and October, with below-normal rainfall.*

Nov. 1982: Temp. 45° (3.5° below ave.); Precip. 3" (Ave.). 1-2 Sunny & mild, then cold. 3-5 Rain, cool. 6-8 Cloudy & cold. 9-11 Rain, snow mountains, cold. 12-15 Clearing & mild. 16-19 Cloudy, cool; showers north. 20-24 Clear & mild. 25-27 Cloudy & cold; rain south. 28-30 Cloudy, cold.

Dec. 1982: Temp. 42° (3° above ave.); Precip. 2" (1" below ave.). 1-4 Sunny & mild. 5-7 Rain, snow mountains. 8-10 Cloudy. 11-15 Few showers, mild. 16-19 Rain, snow mountains, cold. 20-23 Clear & mild. 24-26 Rain, then snow. 27-29 Cloudy & cold. 30-31 Rain & snow south, cold.

Jan. 1983: Temp. 27° (8° below ave.); Precip. 2.5" (0.5" below ave.). 1-3 Cold, light snow. 4-8 Cloudy & cold, flurries. 9-12 Light snow, heavier south; cold. 13-16 Sunny, then flurries; milder. 17-19 Rain, snow mountains, mild. 20-23 Cold, snow. 24-26 Clearing, seasonable. 27-31 Blizzard; very cold.

Feb. 1983: Temp. 36.5° (1° below ave.); Precip. 2.5" (Ave.). 1-4 Clearing, unseasonably cold. 5-9 Light snow, then sunny, seasonable. 10-15 Rain, snow mountains, mild. 16-19 Sunny & mild, then snowstorm north, gale coast. 20-22 Seasonable. 23-25 Rain & snow. 26-28 Clearing.

Mar. 1983: Temp. 40° (5.5° below ave.); Precip. 3" (0.5" above ave. north; 0.5" below south). 1-4 Cold, snow. 5-7 Cloudy, cold. 8-10 Cold, rain, snow mountains. 11-15 Cloudy & cold. 16-18 Partial clearing, cold. 19-21 Rain east, snow west. 22-25 Mild, rain. 26-31 Severe cold, flurries.

Apr. 1983: Temp. 52° (4° below ave.); Precip. 6" (3" above ave.). 1-2 Clear & warm. 3-5 Rain, cool. 6-9 Cloudy, cool; then rain. 10-14 Sunny & cool, then thundershowers. 15-16 Clear, seasonable. 17-20 Cold wave, rain, snow mountains. 21-23 Showers. 24-26 Rain, cold. 27-30 Sunny, cool.

May 1983: Temp. 64° (3° below ave.); Precip. 3" (1" below ave.). 1-6 Gradual clearing & warming. 7-9 Rain, unseasonably cool. 10-13 Clear & warm. 14-17 Cool, intermittent showers. 18-20 Scattered showers, hot. 21-24 Rain & cool; then clear & warm. 25-27 Thundershowers, cool. 28-31 Rain, very cool.

June 1983: Temp. 74° (0.5° below ave.; 2° below north); Precip. 1" (2" below ave.; 2" above north). 1-6 Rain north & west, cool. 7-12 Sunny, warm. 13-16 Thundershowers, cool. 17-21 Sunny & warm, showers north. 22-24 Rain north & west, cool. 25-27 Sunny, cool. 28-30 Showers, warm.

July 1983: Temp. 76° (3° below ave.); Precip. 6" (2" above ave.; 0.5" above north). 1-3 Showers; clearing. 4-6 Thundershowers, cool. 7-9 Cool, thundershowers south. 10-15 Sunny, hot. 16-18 Showers, cool. 19-23 Sunny, then showers, warming. 24-26 Clear & hot. 27-31 Thundershowers, then clear & hot.

Aug. 1983: Temp. 76° (1.5° below ave.); Precip. 3" (1.5° below ave.). 1-5 Hot & humid, showers north. 6-9 Cloudy, cool. 10-12 Showers. 13-16 Sunny, seasonable. 17-23 Showers west, cool; then warm. 24-27 Cloudy & cool. 28-31 Showers, cool.

Sept. 1983: Temp. 69° (2° below ave.); Precip. 4" (1" above ave.). 1-6 Rain north, cool. 7-12 Sunny, warm. 13-16 Showers east, cool. 17-20 Clearing, cool. 21-25 Sunny, warm. 26-28 Hot. 29-30 Showers, mild.

Oct. 1983: Temp. 55° (4° below ave.); Precip. 2" (1" below ave.). 1-5 Partly cloudy, unseasonably cool. 6-8 Showers, warming. 9-11 Clear & warm. 12-14 Rain, heavy north, cool. 15-20 Clear & warm. 21-23 Showers, cool. 24-26 Cold, rain & snow. 27-31 Clear & warm, then rain.

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4. PIEDMONT & SOUTHEAST COASTAL

For regional boundaries, see map p. 96.

SUMMARY: *The winter overall will be colder than usual, with below-average total precipitation; but snowier than normal during the latter part of the winter. November and December will both be relatively dry, with drought conditions developing before relief at Christmas time. Exceptional cold at the beginning and end of November will more than compensate for milder periods. After Christmas, prolonged cold spells may occur, with a particularly severe cold wave expected the last week of January and first week of February. Above-average snowfall should result from the low temperatures, particularly in mountainous areas. A cool and wet period at the end of April and the beginning of May may delay spring by two to three weeks, but warmer and drier conditions should exist for the balance of the month. June will be warmer and wetter than average, with heavy showers occurring well past mid-July before a dry period sets in. Cool periods prior to mid-July and during the latter part of August are expected to counter a hot and dry period the last week of July and first week of August. Heavy rains the third week of August may cause floods. After heavy mountain rains in early September, dry weather is expected for an extended period. September will begin warm, then turn cool to bring overall temperatures close to average.*

Nov. 1982: Temp. 48° (2.5° below ave.); Precip. 1.5" (1" below ave.). 1-2 Mild, showers. 3-4 Rain, heavy northeast, cold. 5-7 Partly cloudy, cold. 8-10 showers, cold. 11-15 Sunny & mild. 16-17 Rain south, cool. 18-22 Clear & warm. 23-26 Rain, turning cold. 27-30 Cloudy & cold, showers.

Dec. 1982: Temp. 46° (3° above ave.); Precip. 2.5" (1" below ave.). 1-4 Sunny & mild. 5-6 Showers. 7-9 Partly cloudy & seasonable. 10-15 Sunny & mild. 16-18 Showers, cold. 19-23 Clearing & unseasonably mild. 24-26 Heavy rain west & south, colder. 27-31 Rain & snow, cold.

Jan. 1983: Temp. 33° (8° below ave.); Precip. 4" (0.5" above ave.). 1-5 Cloudy & cold, snow west. 6-8 Clear & cold. 9-12 Rain, then snowstorm, cold. 13-15 Cloudy & cold. 16-19 Rain, snow west, milder. 20-23 Sunny & seasonable. 24-28 Colder, then snowstorm. 29-31 Clearing, very cold.

Feb. 1983: Temp. 41° (2° below ave.); Precip. 3" (0.5" below ave.). 1-5 Clear & cold. 6-8 Sunny, seasonal. 9-11 Rain, snow mountains, mild. 12-15 Clearing, then rain, mild. 16-17 Seasonable. 18-21 Showers, colder. 22-24 Rain, snow mountains, cold. 25-28 Cloudy & cold.

March 1983: Temp. 47.5° (3° below ave.); Precip. 3" (1.5" below ave.). 1-4 Cold; rain, snow mountains. 5-7 Partly cloudy, seasonable. 8-10 Rain. 11-15 Cloudy & cold, then clearing. 16-20 Rain east, snow west. 21-24 Clearing & warm, rain north. 25-28 Seasonable. 29-31 Snowstorm, cold.

Apr. 1983: Temp. 60° (0.5° below ave.); Precip. 2.5" (1" below ave.). 1-5 Clear, mild; then rain. 6-8 Sunny, warm. 9-11 Cool, rain west. 12-14 Rain, mild. 15-18 Cold, rain. 19-23 Clear, warm, then cloudy. 24-26 Rain, cool. 27-30 Cloudy, rain, cool.

May 1983: Temp. 67.5° (3° below ave.); Precip. 2" (1" below ave.). 1-5 Partial clearing, turning warm. 6-8 Rain, unseasonably cold. 9-13 Mostly clear & hot. 14-16 Rain, unseasonably cool. 17-20 Clearing & warm. 21-25 Showers, then clear & warm. 26-28 Cloudy, seasonable. 29-31 Moderate to heavy showers.

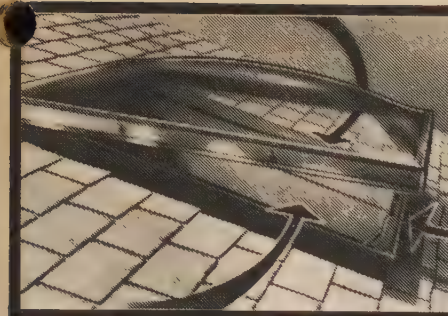
June 1983: Temp. 76° (1° above ave.); Precip. 6.5" (2.5" above ave.). 1-4 Rain, cool. 5-7 Sunny, seasonably warm. 8-10 Showers, heavy east. 11-13 Clear & hot. 14-18 Showers east, heavy rain west; warm. 19-20 Sunny & hot. 21-24 Rain north & west; showers southeast. 25-28 Sunny, cooler. 29-30 Rain, cool.

July 1983: Temp. 78° (0.5° below ave.); Precip. 4.5" (Ave.). 1-4 Sunny, scattered showers; hot. 5-7 Cloudy, turning cool. 8-10 Rain, very cool. 11-16 Partial clearing, seasonable; rain west. 17-19 Rain, cool. 20-24 Partly sunny, scattered showers; turning hot. 25-31 Clear & hot, scattered showers.

Aug. 1983: Temp. 78° (Ave.); Precip. 5" (1" above ave.). 1-3 Clear, hot. 4-6 Showers, hot. 7-9 Partly cloudy, milder. 10-14 Seasonable, showers. 15-19 Heavy rain, cool. 20-22 Showers. 23-26 Sunny & mild. 27-31 Clear, hot; showers west.

Sept. 1983: Temp. 74° (2° above ave.); Precip. 1.5" (2° below ave.). 1-2 Clear & hot. 3-5 Rain, warm. 6-11 Sunny, warm; then showers. 12-14 Clear, hot. 15-17 Rain, cool. 18-23 Clear & warm, showers east. 24-28 Sunny, hot. 29-30 Rain, warm.

Oct. 1983: Temp. 60° (1° below ave.); Precip. 1" (1.5" below ave.). 1-3 Cloudy & cold; rain south & east. 4-6 Showers, mild. 7-11 Clear & warm. 12-14 Rain, cool. 15-20 Clear, seasonable. 21-23 Cloudy, cool; rain west. 24-27 Clearing & mild. 28-31 Sunny, warm; showers east.



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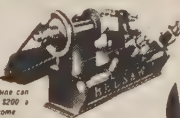
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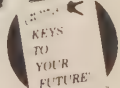
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5. FLORIDA

For regional boundaries, see map p. 96.

SUMMARY: The winter will be colder than average and have variable precipitation, with alternating wet and dry periods. Except for warm spells at the beginning of the month and at mid-month, November is expected to be quite cool and dry in central sections. A possible tropical storm in the Gulf may bring excessive rains to southern sections. December will be sunnier and drier than usual, although nighttime temperatures in central sections may be considerably below normal. January is expected to be considerably colder and wetter than usual, with frost in southern sections at the end of the month. February will start out cooler and drier than average and end cooler and wetter. March should be sunnier, warmer, and drier than usual but with below-average nighttime temperatures. Following a warm and wet first half of April, an extended cool and dry period will persist almost through May. Frequent thundershowers are expected through June; temperatures should be close to average. The summer is expected to be cooler than normal in central and southern sections and warmer than average north. Thundershowers during the first three weeks of July in north and central sections will bring those regions well above average rainfall. Southern sections will be relatively dry until August and September, while northern sections may anticipate fewer showers than usual. October will be cool in north and central sections.

Nov. 1982: Temp. 65° (2° below ave.; 0.5° below north); Precip. 1" (0.5" below ave.; 0.5" above north). 1-2 Clear & hot. 3-5 Cold, showers; possible tropical storm south. 6-8 Sunny, seasonable; showers south. 9-11 Cool. 12-15 Clear & warm. 16-18 Rain north, mild. 19-21 Cloudy. 22-24 Rain. 25-28 Cloudy, cool. 29-30 Clearing; cool.

Dec. 1982: Temp. 60° (2° below ave.; 2° above north); Precip. 0.5" (1.5" below ave.). 1-5 Clear & warm. 6-8 Showers, cool. 9-15 Clear & mild. 16-18 Cloudy; showers north. 19-23 Sunny & warm. 24-28 Showers; cold nights. 29-31 Showers, mild.

Jan. 1983: Temp. 52° (8° below ave.; 3° below south); Precip. 3" (0.5" above ave.; 3° above south). 1-3 Rain, cool. 4-7 Frost north, showers south. 8-12 Rain, mild; cool north. 13-18 Warming, showers north. 19-22 Cool; clearing. 23-26 Rain, frost central. 27-28 Rain. 29-31 Cold, frost south.

Feb. 1983: Temp. 56° (5° below ave.); Precip. 3" (Ave.; 0.5" above ave. north & south). 1-3 Hard frost. 4-8 Clear days, cold nights, frost north. 9-11 Rain, mild. 12-15 Sunny & mild, then rain. 16-20 Sun, few showers, cool. 21-23 Rain, mild. 24-28 Clear, cold.

March 1983: Temp. 64° (3° below ave.); Precip. 2.5" (1" below ave.; 2" below north). 1-3 Cold; showers north. 4-8 Partly cloudy & warm. 9-12 Showers, then clearing. 13-15 Rain, cool. 16-19 Clear, warm, rain north. 20-25 Cloudy & cool; then clearing, warm. 26-31 Showers, then cool.

Apr. 1983: Temp. 70° (2.5° below ave.; 0.5° below north); Precip. 6" (3" above ave.; 0.5" below south). 1-5 Showers, then warming. 6-9 Sunny, warm, showers. 10-13 Cloudy, then rain. 14-16 Seasonable. 17-19 Cold, rain north. 20-23 Cloudy, warming. 24-26 Rain, cool. 27-30 Clear & warm.

May 1983: Temp. 74° (7° below ave.; 5° below north); Precip. 1.5" (2° below ave.; 4° below south). 1-3 Rain, mild. 4-6 Showers, cool. 7-10 Warm south, cool north. 11-14 Cold nights; cloudy south. 15-17 Rain, cool. 18-22 Sunny, mild. 23-28 Clear; cool nights. 29-31 Showers, mild.

June 1983: Temp. 81° (1° below ave.; 1° above north); Precip. 5" (2° below ave.; 2° above north; 6° above south). 1-3 Clear, warm. 4-7 Showers, warm. 8-11 Thundershowers, cool. 12-14 Showers, warm. 15-17 Showers, heavy south. 18-20 Showers, warm. 21-26 Clear, hot. 27-30 Rain, warm.

July 1983: Temp. 82° (1.5° below ave.; 0.5° above north); Precip. 10" (2° above ave.; 5° below south). 1-3 Rain south, sun north. 4-7 Cloudy, rain north. 8-15 Rain central & north. 16-19 Showers. 20-23 Rain, mild. 24-29 Clearing, hot. 30-31 Showers.

Aug. 1983: Temp. 82.5° (1° below ave.; 1° above north); Precip. 6" (1" below ave.; 3° above south). 1-5 Showers. 6-10 Thundershowers, mild. 11-15 Sunny, hot, few showers. 16-18 Showers, warm. 19-24 Hot. 25-27 Showers. 28-31 Hot central, showers south.

Sept. 1983: Temp. 80° (2° below ave.; ave. north); Precip. 10" (3" above ave.; 4° below north). 1-4 Showers, hot. 5-9 Sunny & hot; then showers. 10-12 Showers, warm. 13-17 Sunny north, showers south. 18-23 Cool nights, few showers. 24-26 Showers. 27-30 Clear & hot; then showers north.

Oct. 1983: Temp. 71° (4° below ave.; 1.5° below south); Precip. 2" (2° below ave.; 4° below north & south). 1-4 Rain, cool north. 5-11 Clear. 12-14 Showers, cool. 15-19 Clear, cool nights. 20-24 Cool, clear. 25-28 Warm days, cool nights. 29-31 Cloudy.

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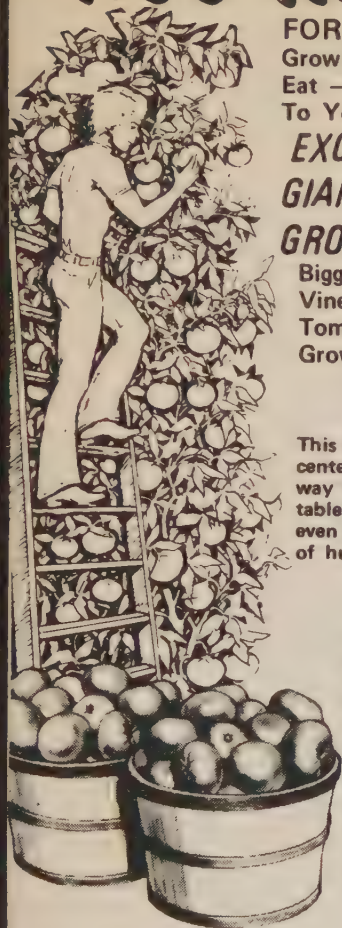
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6. UPSTATE N.Y.-TORONTO & MONTREAL

For regional boundaries, see map p. 96.

SUMMARY: *The winter is expected to be colder and drier than normal, with slightly less than the usual amount of snow, although several severe snowstorms are anticipated toward the end of the season. November will begin cold and wet, with some heavy snows in the mountains, followed by generally cold and dry weather. December will start out mild and dry and vary between seasonable and mild until severe winter weather is ushered in at the end of the year with a snowstorm at Christmas. Except for brief mild periods at mid-January and mid-February, temperatures will be below normal through the balance of the winter and into the first few days of May, with notable cold snaps the second and fourth weeks of January and the first, third, and fourth weeks of March. January should have below-average precipitation, but above-normal snowfall, particularly near the Great Lakes; several snowstorms may be expected in February and March. Spring will be quite late due to a cool and wet April, while May through the first three weeks of June should see more seasonal temperatures, with much variability. The last week of June through mid-July will be cool; hot and humid weather, with heavy thundershowers, is expected the last week of July and first week of August. September will be wet, October will be dry.*

Nov. 1982: Temp. 34° (5° below ave.; 3° below west); Precip. 3" (Ave.; 3" below ave. west). 1-3 Rain, cold. 4-6 Rain, snow mountains; cold. 7-8 Partly sunny, cold. 9-11 Showers. 12-16 Showers, cold. 17-19 Very cold. 20-22 Sunny & mild. 23-25 Cold, cloudy. 26-30 Seasonable west, cloudy & cold east.

Dec. 1982: Temp. 29° (2° above ave.; 5° above west); Precip. 1.5" (1.5" below ave.). 1-5 Clearing, mild. 6-8 Rain. 9-11 Cold, snow. 12-15 Rain & snow mixed. 16-19 Cold & snowy east, mild west. 20-23 Showers. 24-26 Rain changing to snow. 27-31 Cold, cloudy, snow.

Jan. 1983: Temp. 16° (5° below ave.); Precip. 1.5" (1" below ave.; ave. west). 1-3 Clearing, very cold. 4-7 Snow, cold. 8-12 Cloudy & cold, light snow. 13-15 Clear, very cold. 16-19 Rain, gales west, mild. 20-22 Cold, light snow. 23-26 Snowstorm, cold. 27-31 Cold, light snow.

Feb. 1983: Temp. 22.5° (0.5° below ave.; 0.5° above west); Precip. 3" (1" above ave.). 1-3 Cold, snow. 4-6 Cold, snow west, clear east. 7-9 Partly cloudy, flurries. 10-15 Flurries, mild. 16-19 Snowstorm. 20-22 Clear & cold. 23-25 Snowstorm, cold. 26-28 Clearing east, snow west.

Mar. 1983: Temp. 26° (7° below ave.); Precip. 3" (Ave.; 0.5" below west). 1-3 Clearing, very cold. 4-7 Light snow, cold. 8-10 Snowstorm, milder. 11-18 Turning bitter cold, flurries. 19-21 Snow & freezing rain. 22-25 Rain & snow, milder. 26-31 Cold, snow.

Apr. 1983: Temp. 41° (5° below ave.); Precip. 5.5" (2.5" above ave.; ave. west). 1-3 Clearing, cool. 4-6 Rain, mild; floods. 7-10 Clearing, then rain, snow north. 11-12 Seasonable. 13-15 Showers. 16-19 Rain changing to snow, very cold. 20-22 Showers, cool.

23-27 Cold, rain, snow mountains. 28-30 Clearing, cool.

May 1983: Temp. 58° (2° below ave.; 3° below west); Precip. 3" (0.5" below ave.; 0.5" above west). 1-5 Clearing, warm. 6-9 Rain, mild east, cold west. 10-14 Showers, warm; then cold west. 15-19 Cool, showers west; then warm. 20-22 Rain, cool. 23-26 Sunny & warm, then rain. 27-31 Rain, cool.

June 1983: Temp. 66° (1° below ave.; 2° below west); Precip. 3" (Ave.; 2" above central & west). 1-7 Rain, cool, then sunny. 8-12 Clear, warm. 13-17 Thundershowers, cooler. 18-22 Showers, warm. 23-26 Rain, cool. 27-28 Clear, cool. 29-30 Rain, cool.

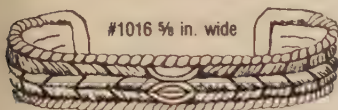
July 1983: Temp. 69° (3° below ave.); Precip. 4" (1" above ave.; 1" below west). 1-5 Rain, cool. 6-9 Cloudy, rainy, cool. 10-12 Hot east, mild west. 13-15 Showers, warm. 16-21 Rain, cool. 22-24 Sunny & hot. 25-31 Hot & humid, thundershowers.

Aug. 1983: Temp. 69° (Ave.; 2° above west); Precip. 2" (1" below ave.). 1-4 Showers, warm. 5-9 Sunny, warm. 10-12 Rain. 13-17 Sunny & warm, hot west. 18-19 Few showers, warm. 20-23 Sunny, hot. 24-27 Rain, cooler. 28-31 Few showers, cool.

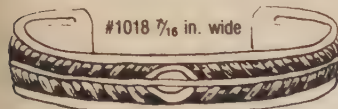
Sept. 1983: Temp. 61° (0.5° below ave.); Precip. 5" (2" above ave.; 1" above west). 1-3 Rain central & south, cool. 4-7 Rain, warm. 8-12 Cool, clearing. 13-15 Rain, cool. 16-18 Cloudy, cool. 19-21 Sunny & warm east, rain west. 22-25 Clear, warm; cloudy west. 26-30 Rain, warm.

Oct. 1983: Temp. 47° (3° below ave.; 1° below west); Precip. 1" (2" below ave.). 1-3 Cold, frost north. 4-6 Clear & pleasant. 7-10 Cloudy & cool. 11-13 Showers, cool. 14-17 Sunny east; showers west. 18-20 Showers. 21-26 Cold, flurries. 27-31 Clear, then showers.

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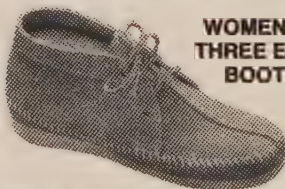
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7. GREATER OHIO VALLEY

For regional boundaries, see map p. 96.

SUMMARY: *Although the winter is expected to be relatively mild until Christmas, with below-average snowfall, thereafter some prolonged cold spells and substantial snowfalls may be anticipated, with record-breaking cold periods possible. November will be colder and drier than usual, with a mild spell for relief about mid-month. December will have several mild periods to end up considerably above average in temperature, with a sizable snowstorm the last week of the year. Prolonged cold is anticipated for January, with a brief respite the third week. Above-average snowfall (despite below-normal precipitation) is expected in January, while February may well have almost twice the usual snowfall. There will also be cold spells at the middle and end of March. April will be quite wet, mild the first half and cool the latter half, and spring may be delayed by two to three weeks. May should be cool and dry, while warm weather the second and third weeks of June will result in a warmer-than-average month. Heavy rains early in the month may cause some flooding in western sections. An unusually long hot spell at the end of July may last well into the first week of August, with a drought developing at the same time. Continued dryness and warm temperatures until the last week of August will further aggravate the drought, before being relieved by cooler and wetter weather by early September. Fluctuations in temperature are expected in September and October; the precipitation will be considerably below average.*

Nov. 1982: Temp. 42° (2° below ave.); Precip. 1" (2" below ave.). 1-3 Rain, cool. 4-10 Cloudy, cold; showers east. 11-14 Light rain, seasonable. 15-18 Sunny & mild, then cold. 19-22 Clear, mild. 23-26 Cold, rain, snow mountains. 27-30 Rain then clearing, colder.

Dec. 1982: Temp. 38° (5° above ave.); Precip. 1.5" (1.5" below ave.; 1" below east). 1-4 Clear, mild. 5-7 Rain, mild. 8-10 Rain, cold. 11-16 Mild, few showers. 17-19 Cold, rain. 20-22 Sunny, warm. 23-26 Cold, snow. 27-31 Snowstorm, cold.

Jan. 1983: Temp. 20° (10° below ave.); Precip. 1.5" (2" below ave.). 1-4 Flurries, cold. 5-8 Very cold, cloudy. 9-12 Snow, cold. 13-17 Clearing & warming, then rain. 18-22 Rain changing to snow. 23-27 Extremely cold; then milder, snow. 28-31 Snow, very cold.

Feb. 1983: Temp. 32.5° (1° below ave.; ave. east); Precip. 3.5" (0.5" above ave.). 1-3 Snow, cold. 4-8 Sun, few flurries, cold. 9-12 Snow changing to freezing rain, milder. 13-15 Rain & sleet, mild. 16-19 Cold, snowstorm. 20-24 Seasonable, then snow. 25-28 Cold, snow.

Mar. 1983: Temp. 37° (4° below ave.); Precip. 3" (1" below ave.). 1-4 Cloudy, cold; snow. 5-6 Clearing & mild. 7-9 Rain, flooding, mild. 10-17 Cloudy, cold, flurries. 18-21 Seasonable, then snow, cold. 22-25 Warm, rain, some sun. 26-31 Very cold, snow.

Apr. 1983: Temp. 52° (2° below ave.; 3° below east); Precip. 7" (3" above ave.). 1-3 Showers, milder. 4-7 Rain, mild. 8-11 Warm, rain east, then cold. 12-15 Rain, cold, then clearing. 16-18 Rain, snowstorm north & east, cold. 19-23 Mild, rain. 24-26 Rain, floods, cold. 27-30 Milder, rain.

May 1983: Temp. 61° (2° below ave.; ave. east); Precip. 2.5" (1.5" below ave.). 1-3 Clearing & warming. 4-8 Rain, very cold. 9-13 Sunny, warm; few showers. 14-18 Partly cloudy, cool; then warming. 19-22 Showers, cooler. 23-27 Thundershowers, then clear & hot. 28-31 Rain, cool.

June 1983: Temp. 73° (1° above ave.); Precip. 4.5" (0.5" above ave.; 2" above east). 1-6 Rain, flooding; cool. 7-10 Clear, warm. 11-17 Rain, very warm. 18-19 Cloudy, mild. 20-24 Thundershowers, warm. 25-28 Cool, then seasonable. 29-30 Rain, mild.

July 1983: Temp. 74° (1.5" below ave.); Precip. 2" (2" below ave.; 2" above east). 1-2 Rain, mild. 3-6 Showers. 7-9 Partly cloudy, cool. 10-15 Clear, warm. 16-18 Thundershowers, cool. 19-22 Warm to cool, showers. 23-26 Sunny & hot. 27-31 Showers, hot.

Aug. 1983: Temp. 77.5° (3° above ave.; 2° above east); Precip. 1" (2" below ave.; 1" below east). 1-4 Few showers, hot. 5-9 Partly cloudy, warm. 10-12 Showers, warm. 13-15 Seasonable. 16-18 Sunny & hot. 19-24 Rain, cooler. 25-29 Partly cloudy, mild. 30-31 Rain.

Sept. 1983: Temp. 68° (Ave.); Precip. 2.5" (Ave.; 2" above east). 1-5 Rain, warm. 6-8 Partly cloudy; showers east, cool. 9-12 Sunny, warm. 13-15 Rain, cool. 16-21 Cloudy & cool, few showers. 22-28 Clear, warm, showers east. 29-30 Rain, cool.

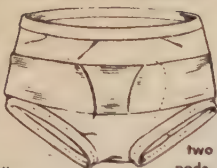
Oct. 1983: Temp. 58° (1° above ave.; 1° below east); Precip. 1" (1" below ave.; 2" below east). 1-4 Sunny, mild. 5-7 Cloudy & cool. 8-10 Clear, warm. 11-13 Rain, turning cool. 14-18 Clearing, warmer. 19-21 Rain, cooler. 22-26 Rain changing to snow, cold. 27-29 Clear, very warm. 30-31 Rain, cooler.

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8. DEEP SOUTH

For regional boundaries, see map p. 96.

SUMMARY: *The winter overall is expected to be considerably colder and drier than usual, but with above-average snowfall, particularly after the first of the year. November should be cold and dry with mild, rainy periods at mid-month. December will be relatively dry and warm until Christmas, then turn wet and cold. Persistently cold periods are expected in January. Although precipitation may be below average, the snowfall is expected to be much above normal. February will begin cold and dry; turn seasonable and wet at mid-month, and then become cold and wet. March will have mild conditions, with little precipitation, most of the month. Although early April will be warm, the remainder of the month will be quite cool and wet, causing a possible two-week delay in spring planting. May will generally be sunny and warm, while June will have more extended cool and wet periods. The summer is expected to start out cool and wet, then turn relatively warm and dry. The first three weeks of July will be cooler and wetter than usual, but then a warm, dry period will extend into August. September will be quite warm and dry.*

Nov. 1982: Temp. 52° (3° below ave.; 2° below north); Precip. 1.5" (2.5" below ave.). 1-4 Rain & cold. 5-6 Sunny, warm. 7-10 Frost; showers north. 11-14 Sunny, warm, showers. 15-17 Rain, cool. 18-20 Clearing & warm. 21-24 Rain north, mild. 25-30 Partly cloudy, cool.

Dec. 1982: Temp. 51.5° (2.5° above ave.; 4° above north); Precip. 5" (Ave.; 1" below north). 1-3 Clearing, cold nights, frost. 4-6 Rain, seasonably cool. 7-16 Clearing & very warm. 17-19 Seasonable; rain central & east. 20-22 Sunny & very warm. 23-31 Rain, changing to snow north; cold.

Jan. 1983: Temp. 35° (12° below ave.); Precip. 3" (1.5" below ave.; 3" below north). 1-4 Unseasonably cold, cloudy; showers east. 5-7 Very cold; hard frost. 8-12 Intermittent snow; very cold. 13-18 Milder, moderate to heavy rain. 19-21 Clearing & colder. 22-25 Severe cold, snow. 26-28 Snowstorm, very cold. 29-31 Extremely cold.

Feb. 1983: Temp. 44° (5° below ave.); Precip. 4.5" (Ave.). 1-4 Partly cloudy, cold. 5-7 Sunny, milder. 8-10 Rain; snow north. 11-14 Sunny, then rain. 15-16 Clear, mild. 17-20 Showers. 21-23 Heavy rain, colder. 24-28 Cold, cloudy; then rain.

Mar. 1983: Temp. 56.5° (0.5° above ave.; 1° below north); Precip. 2" (4" below ave.). 1-2 Cloudy, cold; showers south. 3-8 Very warm, scattered showers. 9-11 Cloudy & cool. 12-15 Rain, cold; then sunny & warm. 16-19 Warm showers, turning cold; heavy rain. 20-22 Sunny, unseasonably warm. 23-26 Seasonable, scattered showers. 27-31 Rain, snow north; very cold.

Apr. 1983: Temp. 64° (2° below ave.; 1° below north); Precip. 6" (1.5" above ave.; 1" below north). 1-4 Rain, mild. 5-8 Clear & hot. 9-12 Rain, cool. 13-15 Sunny, warm. 16-18 Rain, cold. 19-21 Clear; mild. 22-24 Rain, cold. 25-27 Partial clearing, cool. 28-30 Rain, cool.

May 1983: Temp. 71° (1.5° below ave.; 2° below north); Precip. 5" (0.5" above ave.; 1" below north). 1-3 Seasonable, showers. 4-6 Rain, heavy south; cooler. 7-9 Sunny & cool. 10-13 Clear & warmer. 14-16 Showers & cool. 17-21 Sunny, warm; then showers. 22-24 Scattered showers, rain northwest. 25-27 Clear, warm. 28-31 Rain, cool.

June 1983: Temp. 78° (1° below ave.; 2° below north); Precip. 3.5" (Ave.; 1" below north). 1-3 Showers; cool. 4-12 Clearing, warm; rain northeast. 13-22 Rain; cool. 23-26 Showers; cool north. 27-28 Clear & hot. 29-30 Showers, cool.

July 1983: Temp. 80.5° (1.5° below ave.; 3° below north); Precip. 8" (4" above ave.; 1" above north). 1-2 Clear & hot. 3-5 Showers, mild. 6-8 Showers, cool. 9-11 Sunny north, showers south; cool. 12-15 Showers, heavy south; mild. 16-20 Showers, mild. 21-24 Sunny, very warm. 25-27 Showers. 28-31 Sunny, hot; showers northeast.

Aug. 1983: Temp. 81° (Ave.; 0.5° above north); Precip. 3" (0.5" below ave.; 1" below north). 1-3 Hot; showers south. 4-8 Rain, south & east; hot north. 9-13 Mild north; showers south. 14-16 Thundershowers, cool. 17-21 Sunny & hot; rain northeast. 22-24 Showers, mild. 25-31 Warm & dry.

Sept. 1983: Temp. 75.5° (0.5° below ave.; 1.5° above north); Precip. 1.5" (1.5" below ave.). 1-4 Showers. 5-8 Sunny, warm; few showers. 9-14 Clear & hot. 15-18 Cool, showers. 19-24 Clear, warmer. 25-27 Hot north, showers south. 28-30 Rain, cool.

Oct. 1983: Temp. 64° (2° below ave.; 2° above north); Precip. 0.5" (2" below ave.). 1-3 Partly cloudy, unseasonably cool. 4-10 Clearing, warmer than average. 11-13 Moderate rain, cooler. 14-18 Clear & warm south, showers north. 19-21 Moderate rain, heavy northeast; unseasonably cool. 22-25 Sunny, warm. 26-31 Clear & warm.

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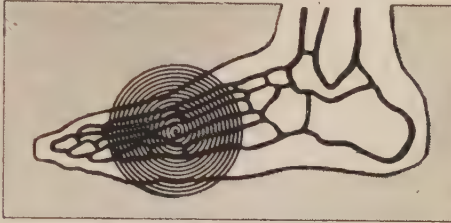
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9. CHICAGO & SOUTHERN GREAT LAKES

For regional boundaries, see map p. 96.

SUMMARY: *The winter is expected to be relatively mild with little snow until about Christmas, but then be quite severe and much snowier than usual beginning with the new year. November is anticipated to be very dry, with near average temperatures. Dry conditions are expected to continue through December, with a significant snowfall coming after Christmas. Persistent cold in January should bring severe winter conditions, with above-average snowfall despite below-average precipitation. February is expected to be cloudier, warmer, and snowier than usual, but a return to more wintry conditions is anticipated for March. Spring may be quite cool, with average and above precipitation expected through April and May. Mid-June should be quite warm and relatively dry; a prolonged cool period is expected for the end of the month and extending well into July. A hot and dry spell the last week of July and first part of August will be followed by cooler and wetter weather. From the second week of September through October, the weather will average close to normal.*

Nov. 1982: Temp. 40.5° (Ave.; 2° below east); Precip. 1" (1.5" below ave.). 1-6 Showers, unseasonably cold east; mild then cold west. 7-10 Cloudy & cold; clearing west. 11-14 Rain, milder. 15-17 Cloudy & cold. 18-21 Clear, unseasonably mild. 22-24 Rain, snow north; turning cold. 25-30 Rain & snow, cold; then clearing.

Dec. 1982: Temp. 35° (7° above ave.); Precip. 1" (1" below ave.). 1-3 Sunny, unseasonably mild. 4-7 Rain, mild. 8-10 Cloudy & cold. 11-15 Partly cloudy, unseasonably mild; showers east. 16-18 Rain changing to snow; colder. 19-22 Sunny & slightly mild. 23-25 Light snow, cold. 26-31 Seasonable, then snowstorm.

Jan. 1983: Temp. 16° (8° below ave.; 6° below east); Precip. 1.5" (0.5" below ave.). 1-4 Snow or flurries; cold. 5-8 Cold; light snow north, intermittent south. 9-12 Snow, extremely cold. 13-17 Milder; then rain & snow. 18-21 Rain, changing to snow; very cold. 22-26 Partly cloudy, extremely cold; light snow east. 27-31 Very cold west, snow north & east.

Feb. 1983: Temp. 29.5° (2° above ave.; ave. east); Precip. 1" (0.5" below ave.). 1-3 Unseasonably cold, light snow. 4-7 Partly sunny, mild. 8-10 Snow, cold. 11-16 Cloudy & cold, some snow; then clearing & milder. 17-19 Flurries; snow north & east. 20-25 Partly sunny, milder; then moderate snow. 26-28 Snowstorm, very cold.

Mar. 1983: Temp. 31° (6° below ave.); Precip. 2" (0.5" below ave.). 1-2 Sunny, very cold. 3-6 Seasonable; rain or sleet. 7-9 Heavy rain, flooding; slightly mild. 10-16 Cloudy & cold. 17-22 Snow, cold; then partial clearing & milder. 23-28 Rain & mild; then turning colder. 29-31 Very cold.

Apr. 1983: Temp. 45° (5° below ave.); Precip. 3" (Ave.). 1-2 Snow, unseasonably cold. 3-6 Mild, partly sunny; showers. 7-9 Heavy rain; cold. 10-14 Clearing, seasonable; then rain. 15-18 Cold; snowstorm east, light

snow west. 19-21 Sunny & mild. 22-24 Rain, unseasonably cold. 25-30 Cloudy, quite cold.

May 1983: Temp. 56° (4° below ave.; 2° below east); Precip. 5" (1.5" above ave.; ave. east). 1-3 Clearing, turning mild. 4-6 Rain. 7-10 Cloudy, very cold. 11-15 Showers; mild, then turning cold. 16-18 Sunny & warm. 19-21 Moderate rain, unusually cold. 22-27 Rain & very cool; then clearing & warm. 28-31 Cloudy, cool, rain.

June 1983: Temp. 67° (3° below ave.; 0.5° below east); Precip. 2" (2" below ave.; 0.5" below east). 1-5 Showers, cool east; very cool west. 6-10 Sunny & very warm. 11-13 Moderate showers east, heavy west; warm. 14-17 Showers & warm east; unseasonably cool west. 18-21 Sunny & warm. 22-24 Rain, turning very cool. 25-30 Cloudy, cool.

July 1983: Temp. 73° (2° below ave.; 1° below east); Precip. 2" (2" below ave.). 1-5 Partly cloudy, then showers, mild. 6-9 Mild east, cool west. 10-13 Sunny, warm. 14-17 Showers; warm then mild. 18-22 Some sun. 23-26 Hot, few showers. 27-31 Showers, very hot.

Aug. 1983: Temp. 73° (1° below ave.; 3° below east); Precip. 4" (1" above ave.; 3" above east). 1-2 Showers, hot. 3-7 Hot & humid. 8-11 Thunderstorms; hot west, mild east. 12-15 Cloudy & mild. 16-21 Showers, warm. 22-26 Rain, very cool. 27-31 Rain, cool.

Sept. 1983: Temp. 65.5° (0.5° below ave.); Precip. 0.5" (2" below ave.; 2" above east). 1-4 Rain, cool. 5-11 Clearing, warm. 12-15 Showers, cool. 16-18 Clearing, cool, then warm. 19-27 Cloudy & cool, then clear & warm. 28-30 Showers, cool.

Oct. 1983: Temp. 56° (0.5° above ave.; 1° below east); Precip. 2.5" (Ave.). 1-3 Clearing & warming. 4-8 Sunny, warm. 9-12 Rain, unseasonably warm. 13-17 Cloudy & cool, then rain west. 18-20 Rain, warm. 21-25 Cold; rain turning to snow. 26-28 Clearing & warm. 29-31 Rain, cool.



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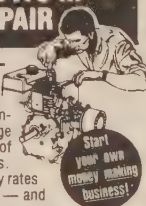
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10. NORTHERN GREAT PLAINS-GREAT LAKES

For regional boundaries, see map p. 96.

SUMMARY: The winter will be considerably drier than usual, with great variability in temperature, but with the average being milder than normal. Beginning with the second week in November and continuing almost to Christmas, mild, sunny, and dry weather will predominate. Snows at the end of the year will bring periods of severe cold through January. Eastern sections will be snowier than usual, but western ones will be drier. February will be mild through mid-month, with a cold snap at the end, and snowier than usual. Above-average snowfall is expected to continue through March and April. March, April, and much of May will average out to be cooler and drier than usual. Beginning in May, conditions will become considerably milder than usual, with several hot spells and a memorable heat wave the last week of July. Frequent warm spells will alternate with brief, seasonable ones from August through October. Precipitation is expected to be considerably below average in western sections through the spring, summer and fall; central and eastern areas will be wet in June and August, but otherwise dry.

Nov. 1982: Temp. 36° (3° above ave.; 6° above west); Precip. 0.5" (1" below ave.; 0.5" below west). 1-3 Rain, snow north; cold. 4-6 Cloudy & cold; showers central & east. 7-10 Sunny & mild; showers north. 11-14 Sunny, seasonable central & east; rain west. 15-21 Clear & warm. 22-26 Clear & mild west; cloudy central & east. 27-30 Cloudy, cold east; dry west.

Dec. 1982: Temp. 29° (10° above ave.); Precip. 1" (Ave.). 1-3 Clear & mild. 4-6 Snowstorm east, light snow west; cold. 7-15 Sunny, warm & dry. 16-18 Snow & cold central and east; sunny west. 19-21 Clear & warm. 22-24 Snowstorm, cold. 25-28 Sunny central & east; sunny west. 29-31 Intermittent snow; seasonable.

Jan. 1983: Temp. 5° (6° below ave.; 9° below west); Precip. 0.5" (0.2" below ave.). 1-4 Light snow, turning cold. 5-10 Extremely cold; snow west and east. 11-15 Flurries, then snowstorm. 16-19 Cold; with heavy snow east. 20-23 Snow, very cold. 24-28 Flurries; milder. 29-31 Very cold wave.

Feb. 1983: Temp. 21.5° (4° above ave.); Precip. 0.8" (Ave.; 0.3" below ave. west). 1-3 Sunny, cold; light snow east. 4-8 Flurries; seasonable. 9-13 Cloudy with flurries west & east. 14-16 Snowstorm central & east; milder. 17-21 Light snow; milder east. 22-28 Turning cold; then snowstorm.

Mar. 1983: Temp. 24° (4° below ave.; ave. west); Precip. 2" (0.2" above ave.). 1-4 Light snow; cold. 5-10 Sunny & mild west; partly cloudy central & east. 11-15 Sunny & mild, then snow west; colder. 16-18 Snowstorm, extremely cold. 19-22 Clearing & mild. 23-27 Cold wave with intermittent snow. 28-31 Cloudy, very cold; then milder.

Apr. 1983: Temp. 44° (1° below ave.); Precip. 1" (1" below ave.; 0.5" below west). 1-3 Rain & snow, cold. 4-6 Warm west; seasonable east. 7-9 Rain, cold. 10-15 Cloudy, then rain. 16-22 Cloudy & cold; then warm. 23-

28 Showers, warm. 29-30 Very cold, rain west.

May 1983: Temp. 58° (2° below ave.; 1° above west); Precip. 2" (1.5" below ave.). 1-6 Clearing east, cloudy west; then rain & very cold. 7-10 Sunny & warm, light rain west. 11-15 Showers, warm. 16-20 Clear & hot; then rain, cool. 21-28 Rain, then clearing. 29-31 Rain, cool.

June 1983: Temp. 70.5° (2.5° above ave.; 3.5° above west); Precip. 6" (2° above ave.; 1.5" below west). 1-6 Showers, then clear & hot. 7-14 Cloudy & cool, showers. 15-20 Sunny & warm, hot west. 21-23 Showers, hot. 24-26 Mild to seasonable. 27-30 Showers, warm.

July 1983: Temp. 76° (3° above ave.; 5° above west); Precip. 2" (1.5" below ave.). 1-3 Showers, mild. 4-10 Clouds, hot. 11-16 Showers, some sun. 17-20 Clear & hot; then showers. 21-28 Very hot, few showers. 29-31 Showers.

Aug. 1983: Temp. 72° (1° above ave.; 2.5° above west); Precip. 4" (1" above ave.; 1" below west). 1-2 Heavy showers; hot. 3-5 Sunny & very hot. 6-10 Intermittent showers & hot. 11-16 Sunny & hot west; rain east. 17-19 Very hot; scattered showers east. 20-23 Showers & mild. 24-27 Clear & warm. 28-31 Quite cool, showers; rain central & east.

Sept. 1983: Temp. 65° (5° above ave.); Precip. 1.5" (1" below ave.). 1-4 Rain, cool. 5-11 Sunny & hot. 12-14 Cold wave; rain central & east. 15-20 Sunny, warm, showers north-east. 21-24 Hot; scattered showers. 25-27 Sunny & warm. 28-30 Rain, very cool.

Oct. 1983: Temp. 54° (4° above ave.; 7° above west); Precip. 1" (1" below ave.; 0.5" below west). 1-6 Clear & warm; then rain. 7-9 Rain, warm. 10-12 Cloudy, rain east. 13-17 Clear, warm. 18-20 Rain, mild. 21-25 Sunny, warm west; showers east. 26-31 Sunny, mild.

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11. CENTRAL GREAT PLAINS

For regional boundaries, see map p. 96.

SUMMARY: *The winter overall will be colder and snowier than average, but with below-normal precipitation. Cold waves at the beginning and end of November should more than balance mild spells in eastern sections, but milder overall conditions are expected in northern and western sections. December will be mild, sunny, and dry almost to Christmas, with drought developing in western sections. A snowstorm at the end of the year may signal an extremely cold and snowy January. Below-normal temperatures should prevail in southern sections through February and part of March, while conditions will be closer to normal in the north until the latter part of March. April will have mild spells closely balanced by cold waves. Variable conditions should continue through May and June. Central sections may be dry; southern parts may experience wetter than usual conditions; northern and western sections may have a dry May only. Seasonal values will prevail for the summer except for a heat wave in the north during July. July may well see serious drought conditions. August should have ample rainfall except for western sections. September and October will be dry and warm.*

Nov. 1982: Temp. 43.5° (1° below ave.; 1° above west; 2° above north); Precip. 2" (1" below ave.; 0.5" below west). 1-4 Showers, cold. 5-9 Partly cloudy, cold. 10-12 Sunny, milder. 13-15 Showers, mild. 16-18 Clear & seasonable. 19-21 Clear, warm. 22-24 Cloudy, cold; showers. 25-27 Sunny & mild west; cloudy, cold east. 28-30 Rain east.

Dec. 1982: Temp. 40° (6° above ave.; 10° above north); Precip. 1.5" (0.5" below ave.; ave. west, 1.5" below east). 1-3 Sunny, cold. 4-6 Rain east, mild. 7-9 Mild west; seasonable east. 10-15 Clear, warm. 16-18 Partly cloudy, cooler. 19-23 Clear, mild. 24-26 Cold; snow east. 27-29 Cold; snow south & west. 30-31 Snowstorm; cold.

Jan. 1983: Temp. 14° (15° below ave.; 10° below northeast); Precip. 1.5" (0.5" below ave.; 0.5" above west). 1-5 Snow; cold west. 6-9 Very cold, flurries. 10-12 Snow. 13-15 Clearing; snow east. 16-18 Milder, snow. 19-22 Sunny, then cold wave; snow. 23-28 Cold. 29-31 Very cold; snow west.

Feb. 1983: Temp. 32° (2° below ave.; 2° above northeast); Precip. 1" (1" below ave.; ave. west & north). 1-5 Cold, then mild; flurries south. 6-8 Cold; snow. 9-13 Cold; snow. 14-19 Changeable, snow west. 20-25 Cold; snow. 26-28 Cold; snowstorm.

Mar. 1983: Temp. 40° (3° below ave.; 0.5° above west); Precip. 1.5" (1" below ave.; ave. northwest). 1-4 Cold, then freezing rain. 5-10 Sunny & mild; then sleet. 11-14 Seasonable, rain. 15-18 Cold, snowstorm. 19-22 Clearing, warm. 23-27 Cold, snow north. 28-31 Very cold, snow.

Apr. 1983: Temp. 56.5° (1° above ave.; ave. southwest); Precip. 3" (1" below ave.; ave. north, 1" above south). 1-3 Showers, warm. 4-9 Sunny; rain east. 10-13 Cloudy, cold; rain. 14-17 Mild, then cold; rain. 18-20 Clear, warm. 21-25 Rain, cold. 26-28 Rain, cooler. 29-30 Cool, showers.

May 1983: Temp. 64° (3.5° below ave.; 0.5° below southwest); Precip. 3" (1" below ave.; 3" above southwest, 2" below north). 1-5 Warming; rain. 6-10 Sunny, cold. 11-13 Thundershowers; warm south. 14-17 Clearing, warm. 18-21 Warm, showers. 22-24 Thundershowers, warming. 25-28 Warm, showers. 29-31 Mild; showers east.

June 1983: Temp. 76° (1° above ave.; 2.5° above north); Precip. 1.5" (3" below ave.; 0.5" above southwest). 1-2 Cool, showers. 3-7 Sunny north; showers south. 8-12 Thundershowers, warm. 13-17 Mild, showers. 18-23 Hot north; showers south. 24-30 Warm.

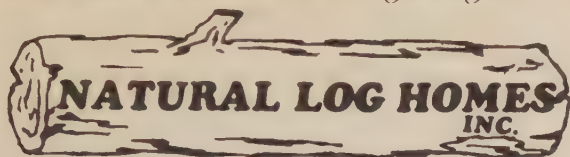
July 1983: Temp. 78.5° (0.5° below ave.; 4° above north); Precip. 2" (2" below ave.; 2" above southwest). 1-3 Sunny west; rain east. 4-8 Sunny; showers west. 9-11 Hot. 12-16 Hot, showers. 17-19 Cloudy, mild. 20-22 Showers, hot. 23-28 Sunny, hot north; showers south. 29-31 Hot, serious drought.

Aug. 1983: Temp. 79° (2° above ave.; ave. south, 1° above north); Precip. 4" (1" above ave.; 1" below west, 5" above northeast). 1-5 Hot; showers north. 6-10 Sunny, showers. 11-13 Cloudy. 14-16 Cool, showers. 17-22 Showers; hot east. 23-28 Sunny & mild; then showers west. 29-31 Showers, hot.

Sept. 1983: Temp. 73.5° (3.5° above ave.; 1.5° above southwest); Precip. 1" (2" below ave.; 2" above southwest). 1-3 Showers, warm. 4-6 Clearing; hot west. 7-9 Hot; showers southwest. 10-15 Few showers, hot. 16-19 Sunny & mild. 20-26 Hot, showers west. 27-30 Cool, rain.

Oct. 1983: Temp. 62° (4° above ave.; 1.5° above east); Precip. 1.5" (1.5" below ave.). 1-3 Sunny & mild. 4-7 Clear east, showers west. 8-11 Warm; showers. 12-16 Mild, then rain. 17-20 Warm, showers east. 21-25 Partly cloudy, cool. 26-31 Clear & warm.

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12. TEXAS-OKLAHOMA

For regional boundaries, see map p. 96.

SUMMARY: *The winter on the whole is expected to be cooler and drier than usual, but with above-average snowfall. Cool periods during November will result in below-average temperatures for the month, while December will be considerably above average, despite cold spells. Northern and western areas may have serious drought. Snow is expected in central and northern parts at the end of the year. Protracted periods of cold, snowy weather early in January will result in a colder than average month, with much less than usual precipitation. February and March will be progressively milder; February will be quite wet, except for drought in the extreme south; March will be quite dry. Spring is anticipated to be cool and wet; western sections will be relatively mild and dry. June will continue the cool and wet weather, except for drier than average conditions in the west. Western sections in July will be hot and dry, but the rest of the region should see cooler and wetter than average weather. August is anticipated to be near average in temperature. Western sections will be dry, with drought developing southwest, but a possible tropical storm may bring torrential rains to eastern sections. Temperatures in September and October should be about normal; the precipitation should be below average except for localized showers.*

Nov. 1982: Temp. 54° (2° below ave.); Precip. 3.5" (1" above ave.; 1" below north & south). 1-6 Partly cloudy, then clear & warm. 7-10 Cloudy, cool, showers south. 11-13 Sunny; warm. 14-16 Showers, cool. 17-22 Seasonable, few showers. 23-28 Sunny, cool. 29-30 Cloudy, cold.

Dec. 1982: Temp. 53° (5° above ave.); Precip. 2" (0.5" below ave.; ave. north). 1-4 Cold, rain, heavy Gulf. 5-7 Clearing, cool. 8-16 Clear & warm. 17-19 Mild, few showers. 20-22 Clear, warm. 23-25 Sunny, mild. 26-28 Showers, warm south, cold north. 29-31 Cold, snowstorm north, rain Gulf.

Jan. 1983: Temp. 34° (11° below ave.; 7° below south & west); Precip. 1" (1" below ave.; ave. west). 1-3 Freeze to Gulf; snow. 4-6 Sunny, cold. 7-13 Snowstorm north, rain south; cold. 14-17 Clear, showers east. 18-22 Clear & mild. 23-26 Severe cold, flurries, rain Gulf. 27-31 Cold, snow north.

Feb. 1983: Temp. 46° (3° below ave.; 1° above west); Precip. 2" (0.5" below ave.; 1" above north). 1-5 Sunny; warm west. 6-9 Rain, snow northeast. 10-16 Variable. 17-22 Cloudy, cold; rain. 23-25 Clearing, cold, frost central. 26-28 Warm, rain.

March 1983: Temp. 60° (3° above ave.; 5° above northwest); Precip. 1" (2" below ave.; 2" above southwest). 1-2 Partly cloudy, cold. 3-6 Clear & warm. 7-11 Clearing & warmer north, showers southwest. 12-15 Sunny, warm. 16-18 Showers, cold. 19-23 Sunny & warming. 24-26 Cloudy, mild; showers southwest. 27-31 Sunny & warm, then cold.

Apr. 1983: Temp. 65° (1° below ave.; 2° above northwest); Precip. 5.5" (0.5 above ave.; 1" below south). 1-4 Warm; showers east. 5-9 Cloudy south; clear & warm north. 10-12 Rain, cool. 13-17 Clearing & warm; then showers. 18-21 Clear, warm. 22-28

Showers, cool; then seasonable. 29-30 Cool.

May 1983: Temp. 73° (3° below ave.; 1° below south, 1° above northwest); Precip. 7" (2" above ave.; 1.5" below south & northwest). 1-4 Showers, mild. 5-11 Sunny & warm, hot central. 12-14 Showers, mild. 15-20 Sunny, warm. 21-24 Showers, mild. 25-28 Rain, mild. 29-31 Partly cloudy & cool.

June 1983: Temp. 79° (3° below ave.; 1° below south); Precip. 6" (3" above ave.; 1.5" below west, ave. northeast). 1-3 Showers, cool. 4-7 Sunny, hot. 8-13 Warm, showers west & Gulf. 14-17 Showers, cool. 18-24 Showers; cool central. 25-30 Cloudy, rain.

July 1983: Temp. 81° (5° below ave.; 0.5° below south); Precip. 4" (2" above ave.; 0.5" above south, 1" below west). 1-2 Clear & hot. 3-5 Showers, cool. 6-9 Showers. 10-16 Clear & hot. 17-21 Showers, hot. 22-24 Seasonable. 25-27 Showers, heavy east. 28-31 Sunny, hot.

Aug. 1983: Temp. 81° (4° below ave.; ave. south & west); Precip. 0.5" (2" below ave.; 0.5" below west). 1-8 Sunny & hot north; rain south. 9-13 Showers, mild; possible tropical storm east. 14-16 Mild, showers northeast. 17-20 Sunny, hot. 21-24 Showers, cooler. 25-28 Sunny. 29-31 Hot.

Sept. 1983: Temp. 77.5° (1° below ave.; 0.5° above south, 3° above west); Precip. 1" (2" below ave.; 3" above northeast). 1-5 Showers, hot. 6-10 Showers. 11-14 Clear & hot. 15-18 Milder. 19-21 Showers west. 22-25 Warm, hot west. 26-30 Showers, mild.

Oct. 1983: Temp. 68° (Ave.; 2° above north, 1° below south); Precip. 0.5" (3" below ave.; 2" above southwest). 1-3 Cold, clear. 4-6 Showers west. 7-10 Sunny & warm north, mild south. 11-14 Showers, then clear. 15-21 Showers, cool. 22-27 Clear & warm. 28-31 Rain east and Gulf; mild.

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13. ROCKY MOUNTAIN

For regional boundaries, see map p. 96.

SUMMARY: *The winter will be considerably warmer than average and with great variability in precipitation. November should be extremely dry and above-average daytime temperatures may create drought conditions in northern and western sections. December will be even warmer. Central and southern sections will continue to be dry while the north will be fairly wet; however, a snowy, cold wave will end the year. After a mild, wet spell early January, more wintry conditions should set in, with above-average precipitation and snowfall through January, February, and early March. The latter half of March will be quite warm and dry while average temperatures, with rain in the north, will prevail in April. Following a cool, wet period early in May, generally warm and dry weather is expected through June. Several heat waves through July and August will produce a warm summer, with drier than usual conditions, except for thundershowers in northern and extreme southern sections. Average temperatures, with above-average amounts of precipitation, are anticipated for September through mid-October; however, clear, Indian summer weather is expected for late October.*

Nov. 1982: Temp. 45° (6° above ave.; 3° above north & south); Precip. 0" (1" below ave.; 0.5" below south). 1-6 Showers, then clear & mild. 7-10 Seasonable, rain northeast. 11-14 Rain, mild. 15-21 Sunny, mild. 22-25 Sunny & dry, drought north. 26-28 Clear & mild, showers north. 29-30 Cloudy.

Dec 1982: Temp. 38° (8° above ave.); Precip. 0.5" (1" below ave.; 1.5" below south, 0.5" below north). 1-3 Cloudy, rain & snow. 4-6 Clearing & mild, rain north. 7-10 Clear, mild. 11-15 Mild, rain north. 16-17 Cloudy, seasonable. 18-21 Mild, rain north. 22-25 Sunny & mild, showers north. 26-31 Snow.

Jan. 1983: Temp. 31.5° (3.5° above ave.); Precip. 4" (2.5" above ave.; 1" above north, 0.5" below south). 1-3 Cold, snow north. 4-9 Mild; rain, snow mountains. 10-16 Snow, cold; then milder, rain. 17-20 Partly cloudy, cold. 21-25 Sunny & mild south; cold north. 26-28 Cold, snow. 29-31 Mild; rain & snow.

Feb. 1983: Temp. 37.5° (4° above ave.; 2° above north & south); Precip. 1.5" (0.5" above ave.). 1-4 Clear, mild. 5-9 Cold, rain & snow. 10-15 Mild, rain, snow mountains. 16-20 Cold, rain & snow. 21-25 Rain, snow mountains. 26-28 Rain, milder.

Mar. 1983: Temp. 46.5° (7° above ave.; 5° above north); Precip. 1" (1" below ave.; 1" above north). 1-4 Mild; rain. 5-7 Rain north, showers south, cold. 8-13 Rain. 14-16 Cold, rain, snow mountains. 17-19 Clearing & warming. 20-22 Sunny & mild. 23-28 Clear & warm. 29-31 Rain.

Apr. 1983: Temp. 53° (4° above ave.; 2° above north); Precip. 3" (1" above ave.; ave. south). 1-5 Rain north, showers south. 6-9 Rain south; cool then warming. 10-16 Rain; cool, mild south. 17-19 Clear & warm. 20-22 Showers south, cloudy north; cool. 23-27 Clear & warm; showers north. 28-30 Rain.

May 1983: Temp. 63° (5° above ave.; 2.5°

above north & south); Precip. 0.5" (1" below ave.; ave. south, 0.5" below north). 1-5 Rain, cool. 6-11 Rain north, sunny & warm south. 12-15 Clear & warm, hot north. 16-19 Showers, warm. 20-23 Few showers, mild. 24-28 Cloudy, then sunny. 29-31 Rain, mild.

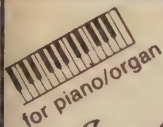
June 1983: Temp. 74° (8° above ave.; 5° above north & south); Precip. 0.2" (1" below ave.; 0.5" below south). 1-3 Partly cloudy, warm. 4-7 Cloudy south, rain north; warm. 8-15 Seasonable, few showers. 16-18 Sunny, hot. 19-21 Showers south, hot. 22-25 Hot, then showers. 26-30 Cloudy, hot.

July 1983: Temp. 80° (4° above ave.; 1.5° above south & north); Precip. 0.2" (0.5" below ave.). 1-4 Sunny & hot north; rain & cool south. 5-8 Showers north, clear & warm south. 9-14 Clear & hot. 15-18 Partly cloudy, hot. 19-22 Rain, mild. 23-26 Partly cloudy north, clear & warm south. 27-31 Clear & warm, then thundershowers.

Aug. 1983: Temp. 79.5° (5° above ave.; 2° above south, 0.5° above north); Precip. 0" (1" below ave.; 0.5" below south & north). 1-3 Cloudy & mild, thundershowers north. 4-8 Sunny & hot; showers. 9-12 Sunny; rain south. 13-17 Clear, hot. 18-22 Clear north; hot south. 23-27 Sunny & hot; rain south. 28-31 Sprinkles north, rain south; milder.

Sept. 1983: Temp. 68° (3° above ave.; ave. south); Precip. 1" (Ave.; 1" above north & south). 1-5 Clear, hot. 6-9 Rain, cool. 10-15 Cloudy, showers. 16-19 Thundershowers, cooler. 20-23 Cool, then rain. 24-26 Clearing, rain north. 27-30 Sunny & mild.

Oct. 1983: Temp. 57° (4.5° above ave.; 2° above south & north); Precip. 2.5" (1.5" above ave.). 1-5 Rain, cool. 6-10 Rain, cool. 11-15 Sunny & cool, then showers. 16-18 Clear & warmer, rain north. 19-25 Indian summer. 26-28 Sunny south, showers north. 29-31 Rain, snow mountains, cooler.



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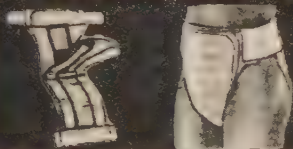
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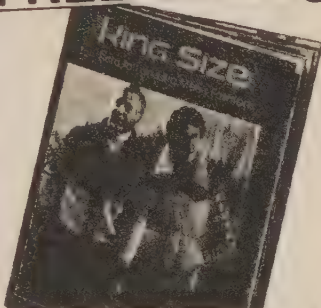
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14. SOUTHWEST DESERT

For regional boundaries, see map p. 96.

SUMMARY: The winter is expected to be warmer and drier than average, with below-normal snowfall in the mountains. Eastern sections should have about average amounts of precipitation. Except for two rainy and mild periods, November should be sunnier and warmer than average. From early in December until Christmas, sunnier, drier and much warmer than usual conditions are expected. A cold wave may arrive at the end of the year, bringing light frost to the west and snow in the mountains. Temperatures should fluctuate for the balance of January. A clear and warm spell at the beginning of February, followed by a cloudy and rainy period, should then give way to generally sunny and seasonable weather on into mid-March, with an extended period of warmer than usual temperatures. Spring is expected to be warmer and drier than average. Drier-than-normal conditions will persist until the end of June, when southern and eastern sections may experience some heavy thundershowers. Temperatures are anticipated to dip briefly below 100° on a number of occasions through June, July, and August, but hot spells will maintain summer temperatures a little above normal in the west, while eastern sections may anticipate near-average temperatures. Precipitation should be slightly below average except where heavy thunder showers occur locally. Look for a wetter than usual fall, with temperatures close to normal.

Nov. 1982: Temp. 64° (4° above ave.; ave. east); Precip. 0.5" (Ave.). 1-6 Clear & warm. 7-10 Clouds, warm; cooler east. 11-14 Rain, cooler. 15-19 Partly cloudy, warm. 20-26 Sunny & warm, few showers. 27-30 Showers; cold east.

Dec. 1982: Temp. 57.5° (5° above ave.); Precip. 1.5" (0.5" above ave.; 0.5" below south). 1-3 Rain, cool. 4-6 Clearing & warming. 7-12 Clear, warm. 13-17 Few clouds, warm. 18-24 Clearing & warm. 25-31 Rain, cold, snow mountains.

Jan. 1983: Temp. 53° (2° above ave.; 2° below east); Precip. 0" (0.7" below ave.; 0.2" above east). 1-3 Clearing, cold, frost. 4-7 Sunny & warm. 8-10 Rain, cool. 11-16 Cloudy, mild; sunny south & east. 17-22 Clearing & warm; cool east. 23-27 Partly cloudy; cold east. 28-31 Sunny & warming.

Feb. 1983: Temp. 57° (2° above ave.; 0.5° below south); Precip. 0.5" (Ave.; 0.5" above south). 1-3 Clear & warm. 4-6 Rain, mild. 7-10 Cloudy & mild. 11-18 Sunny & mild; cold nights south. 19-21 Cloudy & cold; showers south & east. 22-25 Clear, mild. 26-28 Rain, colder.

Mar. 1983: Temp. 64° (4° above ave.; 2° above south); Precip. 0.1" (0.5" below ave.). 1-2 Showers, warm; clear east. 3-5 Clear, warm. 6-9 Sunny, mild. 10-14 Clear, warmer. 15-18 Cloudy, mild, few showers. 19-22 Clear & warm. 23-26 Cloudy, showers east, then clearing. 27-31 Sprinkles, then warm.

Apr. 1983: Temp. 71° (3° above ave.; 1° above south & east); Precip. 0.1" (0.2" below ave.). 1-3 Cloudy, warm. 4-5 Clear & warm. 6-8 Rain, cool. 9-13 Sunny, warm. 14-18 Clear & hot. 19-22 Cloudy & cool, few showers. 23-27 Sunny & hot. 28-30 Mild.

May 1983: Temp. 80° (4° above ave.; 1°

above south & east); Precip. 0" (0.1" below ave.; 0.2" above south & east). 1-4 Cloudy, cool, few showers. 5-9 Clear & hot. 10-13 Sunny & warm, showers east. 14-20 Partly cloudy then clearing; hot. 21-24 Light rain, hot. 25-31 Partly cloudy, seasonable.

June 1983: Temp. 88° (4° above ave.; ave. south & east); Precip. 0" (Ave.; 1" above south). 1-3 Partly cloudy, hot; showers east. 4-9 Clear & hot, then partly cloudy. 10-15 Seasonable; few showers east. 16-19 Clearing, hot; showers east. 20-25 Sunny, hot. 26-30 Thundershowers, cooler.

July 1983: Temp. 92° (1° above ave.; ave. south); Precip. 0.7" (Ave.; 1" below south, 0.5" above east). 1-3 Cloudy, few showers. 4-6 Clearing, hot. 7-16 Clear, highs near 110°. 17-22 Clouds, & then thundershowers; milder. 23-27 Sunny, hot, seasonable east. 28-31 Showers, milder.

Aug. 1983: Temp. 90° (1° above ave.; 1° below east); Precip. 0.5" (0.5" below ave.; 0.5" above south). 1-4 Partly cloudy, few showers, hot. 5-9 Sunny, seasonable; then showers. 10-17 Hot, sunny; few showers east. 18-22 Showers, cool. 23-26 Sunny & hot, few showers. 27-31 Seasonable, showers.

Sept. 1983: Temp. 85° (1° above ave.; 2.5° above east, 1° below south); Precip. 1.5" (1" above ave.; 1" below east). 1-4 Clear, hot. 5-9 Cloudy, few showers, milder. 10-15 Sunny, hot. 16-18 Rain, hot. 19-21 Seasonable. 22-24 Rain, cooler. 25-30 Sunny & hot.

Oct. 1983: Temp. 75° (3° above ave.; 1° above south); Precip. 1" (0.5" above ave.; ave. south & east). 1-4 Showers, hot. 5-7 Cloudy, seasonable. 8-10 Showers, milder. 11-14 Clear & warm, then milder. 15-18 Few showers, warm. 19-21 Clearing & warmer. 22-29 Clear & hot. 30-31 Showers.

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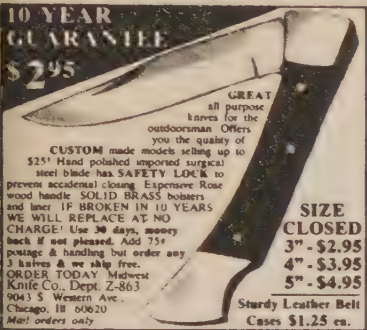
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15. PACIFIC NORTHWEST

For regional boundaries, see map p. 96.

SUMMARY: The winter will be considerably milder than usual. Precipitation will be distributed irregularly, with some unseasonably dry periods followed by some excessively wet ones. The total snowfall will be below average. Temperatures through November and December, until Christmas, will be above normal with brief periods of cooler values. November may be considerably drier than usual, while frequent and often heavy precipitation through December should make for an unusually wet month. Following a cold spell at the end of the year, temperatures should again remain at and above normal through the rest of the winter. Precipitation and snowfall are anticipated to be below average in January, but considerably above in February. March, too, is expected to be quite wet and relatively mild. Beginning with the last week of March, unseasonably warm days are expected to occur through April and May, resulting in a very warm spring. Above-average rainfall is anticipated in April and the first part of May, with drier weather thereafter. After the first part of June, unusually warm and dry conditions are expected until after mid-July, when cooler and wetter weather may prevail into August. Late August, September, and October will be warmer than usual, with mild nighttime temperatures and numerous thunderstorms.

Nov. 1982: Temp. 50° (5° above ave.); Precip. 2" (4" below ave.). 1-5 Clear & mild. 6-9 Rain, then partly cloudy, cool. 10-12 Rain, mild. 13-15 Cloudy & cool, showers north. 16-20 Showers, then sunny & mild. 21-24 Showers, seasonable. 25-30 Rain, heavy north, then clearing; mild.

Dec. 1982: Temp. 47° (6° above ave.); Precip. 6.5" (0.5" above ave.; 2.5" above north). 1-3 Rain; cloudy north; cold. 4-6 Rain, heavy north, milder. 7-9 Sunny & mild; showers north. 10-15 Rain, milder. 16-17 Partial clearing. 18-24 Heavy rain, mild. 25-29 Turning cold, hard frost. 30-31 Scattered showers, snow mountains.

Jan. 1983: Temp. 41° (3° above ave.; 6° above north); Precip. 4.5" (1.5" below ave.; 0.5" below north). 1-4 Rain, snow mountains, cold. 5-11 Rain, mild. 12-15 Rain; mild north. 16-18 Rain, cold. 19-22 Sunny & mild. 23-27 Showers, cold; milder north. 28-31 Rain, mild.

Feb. 1983: Temp. 48° (5° above ave.); Precip. 8" (4" above ave.; 0.5" above north). 1-2 Rain north, showers south; mild. 3-6 Partly sunny, mild. 7-14 Rain, mild. 15-22 Rain, snow mountains. 23-25 Clearing, mild. 26-28 Rain, snow mountains, cold.

Mar. 1983: Temp. 52° (6° above ave.); Precip. 6" (2.5" above ave.). 1-7 Rain, mild. 8-11 Showers; mild. 12-16 Rain, cold. 17-21 Clear, warm; then rain & cooler. 22-24 Clearing & warming. 25-28 Sunny, warm. 29-31 Thunder showers.

Apr. 1983: Temp. 56° (5° above ave.); Precip. 3" (1" above ave.). 1-4 Rain, mild. 5-10 Partial clearing, warming. 11-14 Rain, cool. 15-17 Clear & warm. 18-21 Partly cloudy, cool. 22-27 Rain, warm. 28-30 Rain, cold.

May 1983: Temp. 61° (4.5° above ave.); Precip. 2.5" (0.5" above ave.). 1-4 Cloudy, cool, rainy. 5-10 Rain & warm, then cool. 11-14 Clearing, warm, few showers. 15-18 Cloudy, warm. 19-21 Showers, mild. 22-29 Sunny & warm. 30-31 Showers, cool.

June 1983: Temp. 67° (5° above ave.); Precip. 0.5" (1" below ave.). 1-3 Clear & warm. 4-7 Thunderstorms. 8-10 Partial clearing, mild. 11-16 Showers, then clear & hot. 17-22 Sunny, warm. 23-26 Cloudy, warm; sprinkles south. 27-30 Clear, hot.

July 1983: Temp. 69° (2° above ave.); Precip. 0.5" (Ave.). 1-2 Partly cloudy, warm. 3-6 Clear & hot. 7-14 Partly cloudy, warm. 15-18 Sprinkles, warm. 19-23 Cloudy, seasonable. 24-26 Showers, warm. 27-29 Cloudy & mild. 30-31 Thunder showers.

Aug. 1983: Temp. 69.5° (3.5° above ave.; 2° above north); Precip. 0.2" (0.5" below ave.). 1-6 Rain, cloudy & mild. 7-12 Sunny, warm. 13-15 Seasonable, few sprinkles. 16-20 Partly cloudy, warm. 21-24 Clearing, warm. 25-29 Cloudy, warm; cooler north. 30-31 Showers.

Sept. 1983: Temp. 66° (4° above ave.); Precip. 1.5" (Ave.; 1" below north). 1-3 Showers, then clear & warm. 4-6 Partly cloudy, seasonable. 7-9 Rain, mild. 10-16 Few showers, warm. 17-19 Thunderstorms. 20-23 Clearing, then showers. 24-28 Clear & warm. 29-30 Cloudy, mild.

Oct. 1983: Temp. 58.5° (5° above ave.); Precip. 4.5" (1" above ave.). 1-3 Rain, cool. 4-5 Clearing, mild. 6-9 Rain, cool. 10-13 Sunny & warm. 14-17 Showers, mild. 18-20 Sunny, warm. 21-25 Rain, warm. 26-31 Rain then clearing, cold.

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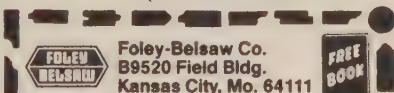
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16. CALIFORNIA

For regional boundaries, see map p. 96.

SUMMARY: *The winter will be much warmer and drier than usual until the new year when wet weather, with ample snow in the mountains, is expected. November days will be alternately warm and cool in the north, while sunny and warm conditions will prevail inland. Southern California should be clear and very warm. Similar conditions will prevail through December into early January, with below-average snowfall during these two months. A series of storms in January, February and early March may bring above-average precipitation to the region, excepting the desert sections, with serious flooding possible in the Sacramento River valley by early March. The high mountains will have above-average snowfall. Early April will bring heavy rains to the north while the rest of the region will be drier than usual. From mid-April well into July, warmer-than-usual weather will prevail for southern and interior sections, with temperatures over 100° for the central valley and desert sections in June and July. North coastal areas will be cloudier and cooler. Similar conditions should prevail through August. Increased showers are expected in the north in September. October will be variable, with a heavy rainstorm to end the month.*

Nov. 1982: Temp. 61° (4° above ave.; 8° above south); Precip. 0.2" (2" below ave.). 1-3 Clear & warm. 4-8 Cloudy coast, sunny inland. 9-11 Clear & warm north, cloudy south. 12-14 Rain south. 15-21 Clear & warm south; cloudy north. 22-27 Clear, warm. 28-30 Rain, snow mountains.

Dec. 1982: Temp. 57° (5° above ave.; 3° above inland); Precip. 1" (3" below ave.; 1.5" below south & east). 1-4 Cloudy, cool; clear & mild inland. 5-8 Sunny & mild. 9-12 Cloudy, cool. 13-15 Rain. 16-25 Sunny; showers north. 26-28 Rain, snow mountains; cold. 29-31 Mild.

Jan. 1983: Temp. 55° (4° above ave.); Precip. 8" (4" above ave.; 1.5" above south). 1-4 Rainy & mild north, sunny & warm south. 5-15 Rain, snow mountains. 16-20 Clear, mild; frost inland, warm south. 21-26 Cloudy & cold; sunny & warm south. 27-31 Heavy rain, snow, milder.

Feb. 1983: Temp. 58.5° (4.5° above ave.); Precip. 3.5" (0.5" above ave.; 1.5" above south). 1-3 Cloudy, mild; clear south. 4-8 Rain, snow mountains. 9-12 Clearing & warm. 13-17 Partly cloudy, cool. 18-20 Rain. 21-25 Clearing. 26-28 Rain, mild.

Mar. 1983: Temp. 58° (5° above ave.); Precip. 5" (2" above ave.; ave. south & inland). 1-5 Rain, snow mountains, floods Sacramento River valley. 6-12 Clearing, warm. 13-16 Cloudy & cool. 17-19 Sunny & warm. 20-25 Showers, then clearing & warm. 26-28 Cloudy coast; clear & warm inland. 29-31 Rain north, seasonable south.

Apr. 1983: Temp. 58° (3° above ave.); Precip. 3" (1.5" above ave.; 0.5" below inland). 1-5 Rain, flooding upper Central Valley. 6-14 Partly cloudy, mild. 15-18 Clear & warm. 19-21 Cloudy, mild. 22-26 Sunny & mild, warm south. 27-30 Cloudy & cooler.

May 1983: Temp. 56.5° (2° below ave.; 2°

above south & inland); Precip. 0.5" (Ave.; 0.3" below inland, 0.5" above south). 1-2 Rain, cool. 3-6 Cloudy & cool; clear & hot south. 7-9 Cloudy, warm; rain north. 10-16 Clear & hot south. 17-20 Sunny, warm. 21-23 Partly cloudy, warm. 24-31 Cloudy & cool; sunny & hot inland.

June 1983: Temp. 56° (2.5° below ave.; 1° above south, 5° above inland); Precip. 0.4" (0.2" above ave.; ave. south & inland). 1-2 Cloudy & cool. 3-6 Rain north, clear & warm south. 7-9 Sprinkles. 10-13 Sunny; hot inland. 14-20 Cloudy & cool; hot inland. 21-25 Cloudy, cool; clear & warm south. 26-30 Mild coast; clear & hot inland.

July 1983: Temp. 56.5° (2° below ave.; 2.5° above south, 1° above inland); Precip. 0" (Ave.). 1-3 Cloudy, cool; sunny & warm south. 4-6 Showers. 7-10 Clearing, warming. 11-19 Cloudy & cool; clear & hot south. 20-26 Cool north; partly cloudy south. 27-31 Clear; hot south & inland.

Aug. 1983: Temp. 57° (2.5° below ave.; 1° above south & inland); Precip. 0" (Ave.). 1-3 Partly cloudy, cool; warm south. 4-12 Cloudy & cool; hot inland and south. 13-18 Cloudy & cool; sunny & warm south & inland. 19-21 Partly cloudy, mild. 22-26 Sunny, warm. 27-31 Cloudy, cool.

Sept. 1983: Temp. 62° (Ave.; 1° below inland); Precip. 0.2" (0.1" above ave.; ave. south & inland). 1-6 Showers, cool; clear south, inland. 7-11 Showers, cool; mild south. 12-15 Sunny & warm. 16-18 Seasonable. 19-23 Showers, mild. 24-26 Clearing. 27-30 Cloudy, cool; clear south.

Oct. 1983: Temp. 64° (1.5° above ave.; 4° above south); Precip. 1" (Ave.; 1" above south). 1-3 Cool inland; clear & warm south. 4-6 Clear, warm. 7-11 Cloudy & cool. 12-14 Few showers. 15-18 Clear, warm. 19-21 Seasonable. 22-25 Clear, warm. 26-31 Cloudy, then rain.

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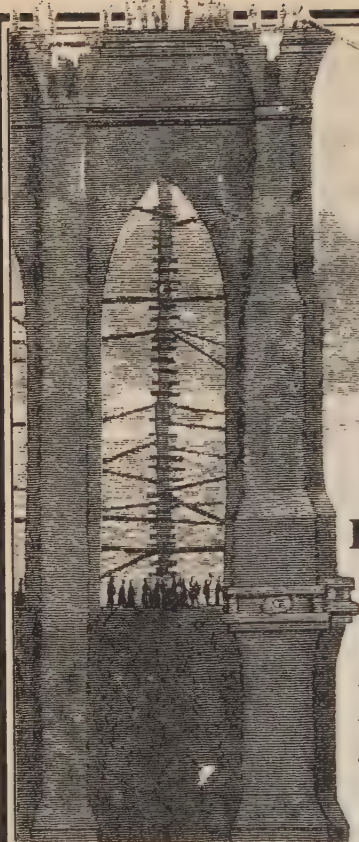
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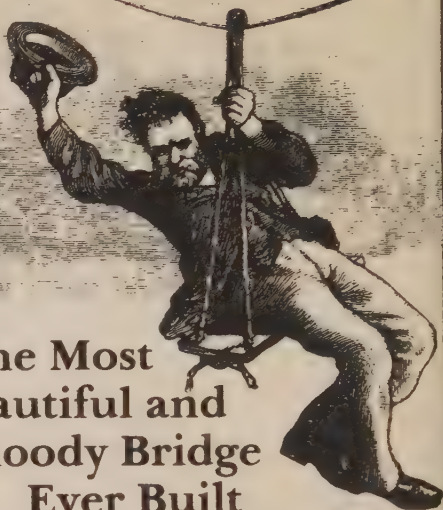
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The Most Beautiful and Bloody Bridge Ever Built



It was opened to traffic 100 years ago after 22 workers met their deaths in various ghastly ways. But, say some, there's nothing on earth, save the Pyramids, to rival it . . .

by Raymond Schuessler

□ TO MANY ARCHITECTS THE Brooklyn Bridge, which was opened to the public 100 years ago, is the most beautiful structure ever built. Dr. David Steinman, himself a builder of more than 400 bridges, has said: "The Brooklyn Bridge remains the most esthetically satisfying of all great bridges because its builders were artists at heart. Of granite and steel and dreams, the bridge was built." But blood, too, was part of the mixture.

John Roebling, a master bridge builder from Germany, submitted a blueprint for a bridge over the East River in 1857. Brooklyn was the fastest-growing city in the nation, but its people had to get to work in New York, 1,600 feet of water distant, and ferry service was unreliable.

To keep the river clear for ships, a

bridge would have to stand 135 feet above the water. No such bridge had ever been built, and many engineers thought it impossible. But in 1867, after a severe winter halted ferry service entirely, the New York state legislature passed a bill authorizing construction of the bridge, and Roebling was appointed chief engineer.

For the next two years, while Roebling's son Washington studied the latest bridge-building techniques in Europe, the chief engineer drew up plans and made preparations. For support the span would require huge towers sunk 75 feet below the river. In Europe, engineers were using a new technique of building underwater foundations by means of pneumatic (air-filled) caissons.

But John Roebling never lived to see

whether the technique would be successful. One day, as he watched through binoculars from the piling of a ferry slip for a possible site for the towers, a ferry crushed his foot. Despite amputation, Roebling developed lockjaw and died within two weeks. Washington Roebling took over his father's project.

The first task was to lay the foundations on either side of the river for the great towers that would support the cables. Relying on his knowledge of European caissons, Washington began to build the huge box-like structures, 108 feet by 168 feet. The caisson was an airtight box complete with roof and sides but no bottom. This 3,000-ton wooden caisson was towed by six tugboats for five miles to the site and sunk in March of 1870.

Workmen now were sent inside the box to excavate the river bottom, the debris being sent up through shafts. Slowly the caisson sank beneath the mud. As boulders were met they were broken with wedges and sledges. Meanwhile the caisson was being driven downward by the increasing weight of the tower as logs and huge granite blocks were laid on top.

The work was slow, sometimes as little as six inches a week during the first month on the Brooklyn side. The average descent on the New York side was two feet a week. When the caissons were sunk to solid footing they would be filled.

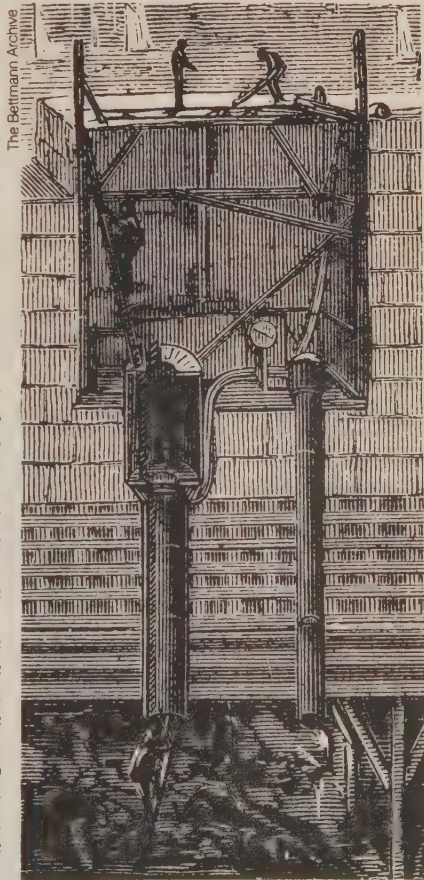
New men were terror-struck as they descended to the bottom and felt the terrible pressure in their heads. E. F. Farrington, the master carpenter of the project, described the eerie interior:

"Inside the caisson everything wore an unreal weird appearance The pulse was first accelerated, and then sometimes fell below the normal rate It became a great effort to speak. What with the flaming lights, the deep shadows, the confusing noise of hammers, drills, chains, the half-naked forms flitting about with here and there a Sisyphus rolling his stone, one might, if of a poetic temperament, get a realiz-

ing sense of Dante's *Inferno*."

Strange things happened in the eerie environment. As the caisson sank deeper, air pressure had to be increased. When the caisson tilted, slight openings developed, allowing the compressed air to escape through the hole and blow a geyser to the surface. Workers on top of the caisson in the process of building the great stone tower were periodically startled to see the unscheduled geyser of mud, stone, and fish go shooting past their noses.

Fire, too, was a constant threat in the compressed air lit by calcium lights, gas burners, and candles. Many small fires had been put out. But one day in



Cutaway of caissons, "like Dante's *Inferno*."

December of 1870 a candle ignited the roof timbers of one caisson and blew the fire deep into the timbered roof piled heavy with layers of logs. It took three fireboats and the Brooklyn Fire Department to contain the blaze. To make sure the fire was out, workmen drilled holes four feet upward into the timber where they found a mass of live coals. The caisson was pumped full of water and left flooded for a few days.

The caisson at Brooklyn reached bedrock at 44 feet, but the New York caisson had to go to 78 feet, requiring an air pressure of 35 pounds per square inch. The "bends," then relatively unknown, attacked the workers.

Men began to twitch in horrible agony. Then they began to die. The first fatality occurred on April 22, 1872, at 51 feet. Two more followed. Over a hundred men were seized with the bends. New York doctors knew nothing about treating such an affliction. One, Dr. Andrew H. Smith, advised:

"Eat well, get enough sleep, don't drink, wear warm clothing!"

Yet information on the bends was available in Europe. It just hadn't been disseminated and Roebling on his visit to Europe must have missed it. In 1854, the French mining engineer M. B. Pol had published this advice: "Experience teaches that the ill effects are in proportion to the rapidity with which transition is made from compressed air to normal atmosphere."

Roebling himself became a victim. He was carried out of the New York caisson in the summer of 1872, semi-paralyzed for life. He lay in his apartment racked with pain and scarcely able to talk. Only barely had he escaped death. He then watched the construction of the bridge from his room at 110 Columbia Heights through binoculars.

No one else could take over the building of the bridge, because the details were in Roebling's head. Instead, his wife Emily, a woman of rocklike

*People were jammed so tight that blood oozed
from their noses and ears.*



courage and love, went to school to study mathematics and engineering, and picked her husband's brain. She began to relay instructions to the engineers on the site and take their comments to Roebling. She inspected the works every day and made technical reports.

In five years both mammoth Gothic towers were completed, rising majestically to 278 feet. A Brooklyn paper exclaimed, "There is nothing on earth save the Pyramids to rival this Brooklyn tower of ours!"

Now the cable wires had to be strung across the towers. The first strands of the four cables were embedded behind each tower in huge stone anchorage blocks. Then the first traveler rope was drawn up over the Brooklyn tower and fastened to the anchorage 900 feet away. A scow carrying more rope on a huge reel was towed across the river while the strand behind it was permitted to sink to the bottom. At the New York side the end of the rope was passed over the New York tower and fastened to a hoisting engine at the tower base.

When they lifted the cable off the riverbed on August 14, 1876, huge crowds gathered on shore and in boats to watch. Through his binoculars Roebling saw the engineer on the scene wait for enough open water to give the signal. A cannon shot was fired to warn shipping, and in a few seconds the rope popped from the surface on both sides, the sparkling strand rising swiftly as workmen and spectators cheered.

Strands of cable now began crossing and recrossing the river, carried by a "traveling wheel." The greatest length of wire laid in one day was 84 miles. Each cable strand of nearly 300 wires was bound together without twisting. Nineteen strands bound together formed one cable 15¾ inches thick. The cable spinning took 18 months.

Once the cables were in place, wire suspenders had to be strung like harp strings from the swaying cables to the bridge floor below. The men at first

were reluctant to work the high wires. Only former sailors who dreaded no height were willing to do the work.

To encourage the men, master carpenter Farrington, who had worked with John Roebling on his other suspension bridges, rode a bosun's chair across the river on the cable while ferryboats blew their whistles and factory sirens shrieked along the waterfront.

Soon all the steel suspenders were hung from the cables to the floor beams below. Girders, stays, trusses, and braces were added in time, and the bridge was made ready for official opening — after 16 years, and 22 workers' lives lost.

The bridge officially opened on May 24, 1883. Thousands lined the shore and watched from boats while Roebling observed through his binoculars.

President Chester Arthur and Governor Grover Cleveland rode in open carriages up to the New York tower, then marched across the bridge while the cannon of naval ships roared a salute. The marchers paraded through Brooklyn until they reached the Roebling house, where they congratulated the crippled engineer.

Pedestrians crossed the bridge all night long until dawn — more than 250,000 in the first 24 hours. More than 150,000 crossed daily for a week. The toll: 1¢ for people, 2¢ for sheep.

Then on Memorial Day, a week after the opening, the bridge claimed more victims. Twenty thousand people were on the bridge that day, going in both directions. The trouble began at the narrow flight of stairs leading to the walkway at the New York side. History doesn't record exactly what precipitated the panic, but some accounts suggest that a woman yelled that the bridge was falling. Crowds going and coming crushed together on the narrow seven-foot stairway. Some fell; others pushed and panicked. People were jammed so tight that blood oozed from their noses and ears. Twelve people were crushed to death. The Brooklyn Bridge had been baptized in blood! □ □



Once the Most Dangerous River in America

Steamboats didn't grow old on the Mississippi. They soon burned up or were blown to bits and, in Natchez, inhabitants shot at them simply for recreation . . .

by Michael Patenaude

□ AS IT PROCEEDS ALONG ITS 2,350-mile route from tiny Lake Itaska in Clearwater County, northern Minnesota, to the Gulf of Mexico, the Mississippi is fed by over a thousand tributaries, 40 of them navigable. With this growing bulk the river is constantly changing character.

Legends of lovelorn Indian maidens plunging from the Mississippi bluffs of the upper river are abundant. It is generally agreed the upper Mississippi is more beautiful; it is often referred to as "she." But with the addition of the muddier Missouri near St. Louis and the larger Ohio at Cairo, Illinois, the imagery changes: the river is masculine, majestic. It is Old Man River, Old Devil River; the heroes of legend are brawling boatmen, river pirates, and the treacherous barge-sized alligator Big Al, the River King.

When the Mississippi's potential as a great inland waterway began to be exploited with settlement and commerce in the 1790s, down the Ohio from Pittsburgh came craft of every description,

and with them, the stuff of legends. "No form of watercraft so whimsical," wrote a contemporary observer, "no shape so outlandish, can well be imagined" that it wouldn't be found somewhere on the river. There were floating tinner's shops, blacksmith's forges, dram shops, produce boats, theatrical companies, and circuses.

For two-way trips before the development of the western steamboat in 1811, the long, slender, lightweight, and shallow-drafting keelboats loaded with sugar and molasses made the up-river trip from New Orleans to Pittsburgh in four months.

The river was becoming a continental thoroughfare. Almost every want and need could be filled without leaving it. But life on the river was hard and dangerous. "In no other period and on no other frontier in American history was human life held so callously," wrote Hodding Carter. "A lone traveler on the Lower Mississippi would not have been a good insurance risk in the first 50 years of the American influx,

roughly from 1795 to the 1840s."

Murderous river pirates and brigands prowled the Natchez Trace and lesser roads, and life was cheap in the bucko dives of Memphis, Vicksburg, and New Orleans. In Natchez Under-the-Hill, two notorious streets of bordellos, saloons, and gambling houses at the base of the Natchez bluff, inhabitants shot at passing steamboats for recreation.

New Orleans was the most dangerous city in America. There was a 20-year tradition that lawmen did not venture into the Swamp district, where there averaged six unreported murders per week among the whorehouses, gambling dens, and whiskey mills. In 1813 Governor Claiborne placed a \$750 price on the head of Jean Lafitte, the pirate. Lafitte countered by doubling the offer for the Governor's neck and continued to walk the streets of New Orleans. In 1842, 500 flatboats gathered and threatened to burn and loot New Orleans after a flatboatman was killed resisting arrest.

Mike Fink was King of the Keelboatmen, a rough-hewn bunch of no-holds-barred fighters with a streak of primitive integrity deep down. They drank tanglefoot or 40-rod, a rotgut whiskey reputed to kill at 40 rods and take the hair off a buffalo robe. A favorite sport of Fink's was "shooting the cup." With his custom-forged Kentucky rifle, Old Bang-All, he would shoot a cup of whiskey from the head of anyone who would stand for it. He met his end in the game when his aim was low and he was killed in retaliation.

It was probably all for the best; old Mike had already been driven from the river by a force even his stupendous strength could not oppose. That force took the form of a 116-foot, slate blue, two-masted sidewheeler, the *New Orleans*, that steamed down the Ohio to the Mississippi late in 1811 to begin a technological revolution in river commerce and the building of a nation.

The historic voyage of the steamboat coincided with one of the most violent

series of nonvolcanic shocks in American history. The New Madrid earthquake lasted from mid-December 1811 until the end of March 1812, as hundreds of shocks struck the entire basin area where Missouri, Kentucky, and Tennessee meet. Some quakes were felt as far downriver as New Orleans and as far northeast as Detroit, Washington, D.C., and Boston.

Steamboats did not grow old. They rarely lasted more than five years before they struck a snag, caught fire, ran aground, or blew up. By 1840, at the zenith of the steamboat era, 520 had met with disaster, killing or injuring 4,000. There were 600 boats on the river that year.

"The history of the steamboat disaster is one of the most terrible and revolting imaginable," wrote river traveler Charles Latrobe in 1836, "and the disregard of human life which is as yet, generally speaking, a feature of the West, is sure proof that the standard of moral feeling is low."

Steamboats were built cheaply and had inferior engines manned by poorly paid and often incompetent engineers. They were firetraps with wooden superstructures and deck cargoes of cotton and hemp.

The romance of the trade further enhanced risk during steamboat races for side bets, pride, and business advantage. Boats competed to "take the horns," a set of gilded antlers worn on the front of the pilothouse of the fastest boat on the river. To push the boats to top speed, barrels of resin or salt pork were thrown into the firebox until the boilers glowed red. Sparks showered down and the chimney paint blistered as engineers, their courage well fortified with spirits, tied down the safety valves to keep steam from escaping. Excited passengers who gathered at the rail on one side to watch the progress of the contest sometimes caused their boats to list and the boilers to run dry and blow up.

Besides the mechanical and human problems with steamboating, there was

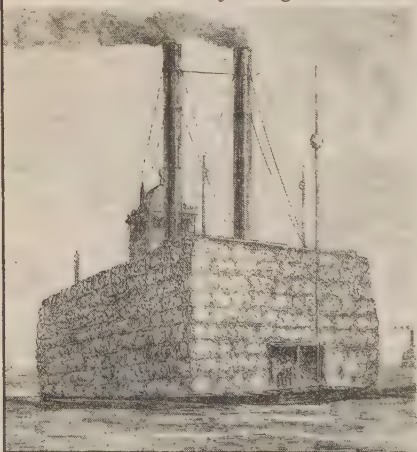
In 1813 the Governor of Louisiana placed a \$750 price on the head of Jean Lafitte, the river pirate. Lafitte countered by doubling the offer for the Governor's neck; he continued to walk the streets of New Orleans.

the ever-changing, always treacherous Mississippi with which to contend. Black roustabouts of the steamboat era blamed many of the river's eccentricities on a male alligator bigger than a barge whom they called Big Al, the River King. Big Al wore a gold crown and held a pipe of tobacco in one scaly paw. The other paw he used to scoop up sandbars and pluck men off boats for his dinner.

Steamboating was so dangerous that owners often ran out of names and switched to numbers. The *Zebulon M. Pike*, built in 1817, blew up within a year. Then came the *Pike II* and *Pike III*. In 1840 the *Pike VIII* was afloat. Its predecessors all burned or were blown to bits. There were seven *Ben Franklins* and eight *Post Boys* over a span of 40 years.

When the *Sultana* blew up after leaving Vicksburg in April of 1865, more lives were lost than in the sinking of the *Titanic*. The disaster killed 1,550 of 2,134 newly released prisoners of war, but it was pushed from the front pages

Cotton steamers were floating tinderboxes.



by news of the assassination of Abraham Lincoln and the search for John Wilkes Booth.

"Mississippi steamboating was born about 1812," wrote Twain. "At the end of thirty years it had grown to mighty proportions, and in less than thirty years more it was dead! A strangely short life for so majestic a creature." Steamboats had killed the old keel-boats by reducing the freight trip to less than a week, he recalled. Now the railroad had done the same to steamboat passenger traffic.

Drastic and rapid change has continued on the river since Twain made those observations in 1883. The cotton plantations that remain on the river have become museums. The others are replaced by chemical and cement plants, granaries, refineries, sulfur and paper mills. The river has been bridled, though not tamed, by 1,600 miles of levee 30 feet high and 300 feet wide. Channels have been deepened and widened, and banks have been stabilized. The river is faster, straighter, more predictable.

It is home to \$7.5-million monster towboats 200 feet long and packing 10,500 horsepower to shove 35 barges loaded with enough corn and soybeans to fill 560 railroad cars. One hundred and eighty thousand persons are employed in the modern barge industry, moving 600 million tons annually, 15 percent of the nation's domestic commerce.

But with all our technology and the billions of dollars the Army Corps of Engineers has spent controlling the river, Big Al still cruises just below the surface. With a switch of his tail he can shift a current, smash tows against bridge piers, dash levees, and flood cities.



ELECTRIC RATE TABLE

Listed below are the costs for operating many residential electrical appliances. The monthly kilowatt hours are based on normal electric usage of a family of four. Dollar amounts are based on the nationally averaged price of 6.2 cents per kilowatt hour for residential electricity. Electric rates vary across the country; to determine your exact costs contact your local electric company for assistance. They can also help you figure the cost of space heating, which is not included below because usage varies depending on such factors as size of home, type of insulation, and whether a secondary heat source is present.

Household Item	Amount of Usage	Monthly Kilowatt Hours	Dollar Cost
A. Year-Round Items:			
Broiler or Roaster	12 hrs./mo.	12	.74
Clock	1 month	2	.12
Coffee Percolator	1 month	8	.50
Dishwasher	1 month	30	1.86
Dryer — Clothes	16 hrs./mo.	80	4.96
Hair (hand-held)	10 hrs./mo.	10	.62
Freezer — Chest, 16 cu. ft.	1 month	90	5.58
Upright	1 month	110	6.82
Frostless	1 month	160	9.92
Iron — Hand	10 hrs./mo.	12	.74
Lighting — 5 rooms (10 75-watt bulbs)	1 month	75	4.65
7 rooms (12 75-watt bulbs)	1 month	85	5.27
Oven — Microwave	1 month	16	.99
Power Tools — Circular Saw	10 hrs./mo.	10	.62
Sander	10 hrs./mo.	3	.19
Radio or Stereo	130 hrs./mo.	10	.62
Range — Conventional	1 month	75	4.65
Self-Cleaning	1 month	80	4.96
Refrigerator — 12 cu. ft.	1 month	65	4.03
Refrigerator/Freezer — 14 cu. ft.	1 month	95	5.89
Refrigerator/Freezer (frostless)			
14 cu. ft.	1 month	155	9.61
17 cu. ft.	1 month	190	11.78
Television — Black & White, Solid State	6 hrs./day	10	.62
Television — Color, Solid State	6 hrs./day	30	1.86
Toaster	1 month	3	.19
Toaster Oven	25 hrs./mo.	15	.93
Vacuum Cleaner	1 month	4	.25
Washing Machine	16 hrs./mo.	10	.62
Water Pump	1 month	20	1.24
B. Seasonal Items, Winter:			
Blanket — Electric	8 hrs./night	20	1.24
Heater — Portable (1,000 watts)	25 hrs./winter mo.	25	1.55
Heater — Auto Engine (500 watts)	12 hrs./night	180	11.16
Water Bed Heater (king size)	winter month	200	12.40
C. Seasonal Items, Summer:			
Air Conditioner — Window Type	summer month	140	8.68
Dehumidifier — Automatic	summer month	100	6.20
Swimming Pool Filter — Above Ground	summer month	240	14.88
Inground 18'x36'	summer month	360	22.32
Fan — Attic	summer month	100	6.20
Window	summer month	60	3.72
D. Electric Water Heating:			
Off-Peak Heater (requires 2 meters)	1 month	275	17.05
Quick Recovery Heater	1 month	350	21.70
Added Hot Water — for Dishwasher.	1 month	100	6.20
for Washing Machine	1 month	75	4.65

NEW WONDER-FORMULA

PEELS OFF PAINT JUST

LIFTS•PEELS•STRIPS AWAY UP TO 18 COATS OF PAINT WITH ONE SINGLE 60-SECOND APPLICATION!

- Simply apply—let dry—peel away paint like paper in one single action
- Ends sanding—scraping—spraying—chipping—steel-wool FOREVER!
- Amazing European discovery turns layers of paint to a single sheet of 'paper' so it peels away just like you'd lift and turn the pages of a book!

WORKS ON ANY SURFACE . . . WOOD, BRICK, METAL, PLASTER, GLASS, STONE, ANTIQUES!



WINDOWS



WALLS & BRICK



FURNITURE

ENDS: sanding•
scraping•spraying
•chipping•steel wool
•toxic chemicals
FOREVER! Remove
years of built-up
paint . . . WITH JUST
A FEW MINUTES
WORK!

Amazing new formula actually penetrates old paint (varnish and lacquer, too), in minutes. Transforms it into a soft, plastic-like film. Then simply let set . . . lift, roll, strip up to 18 coats of paint away in a single peel-away action! Yes, years of built-up paint peel away as quick and easy as you'd turn this very page! Ends sanding, scraping, chipping and foul-smelling chemicals **ONCE AND FOR ALL!**

There's no dust up. No clean up. Just a single peel-away action restores the bare, original finish . . . good as new in a flash!

SO EASY EVEN A CHILD CAN DO IT!

Called 'Peel-Away', this new wonder-formula has been officially registered with Gov't. patent offices throughout the World. It is completely odorless—completely safe! Reacts only with paint, varnish, lacquer or shellac . . . nothing else! So you can use it on even finest furniture, precious art frames, why even delicate wicker or valuable painted-over marble. In fact, it is so safe, so gentle, it is used by London's British Museum and world-famous art galleries to strip

old art frames and century-old paneling. Even used by antique dealers to strip down priceless furniture treasures for restoration. Yes, 'PEEL AWAY' literally lifts away every last layer of paint even from hard-to-get-at places such as impossible-to-reach windowpane corners . . . grooved molding . . . finely tooled woodwork etc., etc.

SIMPLY COAT IT ON—SEE IT TURN PAINT "PAPER" IN JUST MINUTES . . . AND PEEL AWAY IN A SINGLE LIFT-OFF ACTION!

Best of all this new wonder-formula is so easy to use. Simply mix with water and coat onto a painted surface. Then press down special 'Peel-Away' magic-fibre Lift-tex strip-away cloth, (included free) . . . let dry and adhere to surface . . . and without even dirtying your hands, lift away old paint, just like you'd peel a banana. As simple and easy as that. No mess. No fuss. No odor. Old paint lifts away like a single sheet of paper. Original bare-wood finish comes through like new again.

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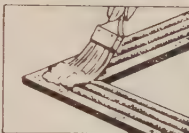
LIKE PAPER!

SO ECONOMICAL TOO! MERE PENNIES PER JOB! AND THE PEEL-AWAY MAGIC-FIBRE CLOTH IS COMPLETELY RE-USABLE, GOOD FOR YEARS TO COME!

Peel-Away is every home-owners dream come true. Ideal for indoors on walls, windows, furniture, etc.—plus 101 outdoor uses too. And it costs only a little more than a penny per foot coverage. Homeowner's size alone gives enough coverage to strip away as much as 500 to 750 feet of wall and door trim, window frames, furniture molding, stair railing, patio furniture, roof-gutters . . . its uses are almost endless.

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So for the new low-cost, super-fast way to peel away old paint . . . lift away old lacquer, varnish and shellac . . . order PEEL-AWAY today on full money-back guarantee. REMEMBER: You must be able to simply coat . . . peel . . . lift and strip away up to 18 layers of old paint in a single peel-away action . . . without sanding, scraping, chipping or steel wool . . . purchase price refunded in full. Order today.



CLEAR & FREE 1-2-3!

STEP 1: Simply coat 'Peel-Away' wonder-formula over old, encrusted paint; (up to 18 layers thick)—



STEP 2: Cover treated area with magic-fibre 'Lift-tex' strip-cloth, (included FREE); let set and adhere to coated surface.



STEP 3: Right before your eyes paint turns to "paper" . . . lifts, peels, strips away IN A FLASH!

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Every Good Cook's Secret Ingredient



Dairy scientists are now able to tell us what farm wives knew all along — buttermilk improves the leavening, texture, and flavor of lots of recipes.

by Susan Mahnke
illustrated by Margo Letourneau

□ "BUTTERMILK," A NUTRITIONIST once observed, "is misnamed. It should really be called *un-buttermilk*." The tart, often thickened liquid with the rich-sounding name is the residue left over from churning butter: cream with most of the butterfat removed. Buttermilk is nutritious (high in protein, low in saturated fat), has only about half the calories of whole milk, and, best of all, is a boon to bakers. Quite an impressive resumé for a food once used mostly for feeding pigs!

In the days when most butter churning was done at home, fresh buttermilk was saved for use as a beverage and as a liquid in cooking. Natural bacteria present in the churn, plus lack of refrigeration, usually caused the buttermilk to sour slightly and thicken, and for some reason this seemed to make baked goods lighter.

But when the dairy industry modernized in the early decades of this century and most butter making shifted to rural creameries, buttermilk was often discarded or used for slopping hogs. In the 1940s, creameries began to dry their buttermilk and sell it in powdered form to commercial bakeries. The cultured buttermilk familiar in dairy cases today also became available; this product is made from skim milk thickened and acidified by adding lactic acid bacteria and bits of butterfat. More recently, a Wisconsin dairy-products firm has developed a powdered buttermilk made from real churned buttermilk and cultured with lactic acid to provide the acidity that has become traditional to the product.

Today dairy scientists know why buttermilk enhances most baked goods. It works in two ways: first, the acid content (created by natural clabbering or by the addition of lactic acid) reacts with alkaline baking soda or yeast to provide extra leavening power, hence lighter cakes and breads; and second, natural emulsifiers called phospholipids, freed by the churning

process, disperse shortening more uniformly through batter, creating an even texture and what bakers call "fine crumb." Real buttermilk, whether powdered or a by-product of churning, functions both as a leavening agent and an emulsifier, while cultured buttermilk made from skim milk does not contain the free phospholipids and therefore aids mostly in leavening.

Whether you churn your own butter, buy skim-milk buttermilk out of the dairy case, or use the new buttermilk powder, the recipes that follow may introduce a new element into your cooking — or reacquaint you with an old friend. Directions are given for liquid buttermilk, with a note for converting to powdered buttermilk.

Recipes courtesy of Saco Foods, Inc., P.O. Box 5461, Madison, WI 53705

Note: To use buttermilk powder in quick bread and cake recipes that call for regular milk, use 4 tablespoons buttermilk powder and 1 cup water to replace each cup of milk. But for each cup of liquid remember to decrease the baking powder in your recipe by 2 teaspoons and add ½ teaspoon baking *soda*. This will provide the correct proportions to allow the buttermilk to react with the soda and create leavening.

Braided Buttermilk Bread

- 2 packages dry yeast
- ½ cup warm water
- 6 tablespoons shortening
- 2 tablespoons sugar
- 2 teaspoons salt
- 1½ cups buttermilk, at room temperature
- 3 eggs (reserving one yolk)
- 7 cups flour

In a small bowl, dissolve the yeast in the warm water and add a pinch of sugar. Do not stir. Let stand for 10 minutes. In a large mixing bowl combine shortening, sugar, salt, buttermilk, eggs (reserving one yolk), and 3½ cups of the flour. Stir in the softened yeast and mix well. Add enough remaining flour to make a dough that is soft and easy to handle. Knead on a floured board for 5 to 10 minutes until dough is smooth and elastic. Cover and let rise until doubled. Punch down, and divide into 3 parts. Divide each third into 3 parts, rolling each piece into a long strand. Braid into 3 loaves, pinch ends

together and tuck under, and place each braided loaf in a greased bread pan. Mix the remaining egg yolk with 1 tablespoon cold water and brush over the loaves. Cover and let rise until doubled. Bake at 375° for 45 to 50 minutes until golden brown. Makes three loaves. **To use buttermilk powder:** Add 6 tablespoons buttermilk powder to flour mixture. Substitute 1½ cups water for the 1½ cups liquid buttermilk.

Light Rye Bread

- 2 packages dry yeast
- 1 cup rye flour
- 4½ to 5½ cups all-purpose flour
- 1 tablespoon salt
- ¼ cup brown sugar
- ¼ cup oil or soft shortening
- 1½ cups warm buttermilk (120°-130°)
- ½ cup warm water

In large bowl, combine yeast, rye flour, 1 cup all-purpose flour, salt, sugar, and shortening. Add warm buttermilk and warm water. Blend at low speed with mixer until moistened; then beat for 3 minutes at medium speed. By hand, gradually stir in enough of remaining all-purpose flour to make a soft dough. Turn out on a floured board and knead until smooth and elastic. Place in a greased bowl, turning to grease all sides. Cover; let rise in warm place until doubled. Punch down. Divide dough into two parts; mold into balls. Allow to rest, covered with an inverted bowl, for 10 minutes. Shape into loaves. Place in two greased bread pans and let rise until doubled. Bake at 400° for 25 to 30 minutes, until loaves are brown and sound hollow when tapped. Remove from pans and cool on racks. Makes 2 loaves. **To use buttermilk powder:** Add 6 tablespoons buttermilk powder to the first yeast-flour mixture. Substitute 1½ cups warm water for 1½ cups liquid buttermilk (to make a total of 2 cups warm water).

Buttermilk Apple Bread

- 2¼ cups all-purpose flour
- ½ teaspoon soda
- 1¾ teaspoons baking powder
- ½ teaspoon salt
- 1 teaspoon cinnamon
- ½ cup butter
- 1½ cups sugar
- 2 eggs
- 1 cup buttermilk
- 2 cups peeled, cored, chopped apples
- 1 cup nuts, chopped

Preheat oven to 350°. Sift together flour, soda, baking powder, salt, and cinnamon. In a separate bowl, cream butter and sugar un-

til fluffy. Beat the eggs until foamy and add to the butter mixture. Beat thoroughly. Add the dry ingredients and the buttermilk alternately, starting and ending with the dry ingredients. Mix only until smooth. Do not overbeat. Fold in chopped apples and nuts. Pour into two greased and floured bread pans. Bake for 50 to 55 minutes, or until breads test done with a toothpick. Let cool for 10 minutes in pans, then remove and cool on racks. **To use buttermilk powder:** Add 4 tablespoons buttermilk powder to the dry ingredients. Omit the cup of liquid buttermilk and add 1 cup water instead.

Buttermilk Bran Muffins

- 1 1/4 cups flour
- 1 teaspoon baking powder
- 1/2 teaspoon soda
- 1/2 teaspoon salt
- 1/2 cup sugar
- 1 1/2 cups all-bran cereal
- 1 1/4 cups buttermilk
- 1 egg
- 1/3 cup salad oil or soft shortening

Sift dry ingredients (except all-bran) together and set aside. In a separate bowl combine all-bran cereal and buttermilk. Stir, and let stand for one or two minutes until cereal is softened. Add egg and shortening and beat well. Add dry ingredients to cereal mixture, stirring only until moistened. Do not overbeat. Spoon batter into 12 greased muffin cups. Bake at 400° for 20 to 25 minutes until muffins are golden brown. **To use buttermilk powder:** Add 4 tablespoons buttermilk powder to the dry ingredients and substitute 1 1/4 cups water for the liquid buttermilk.

Quick (One-Rise) Orange Buttermilk Sweet Rolls

- 2 packages dry yeast
- 1/2 cup sugar
- 1/2 teaspoon baking soda
- 2 teaspoons salt
- 5 1/2 to 6 cups flour
- 1/2 cup soft butter or margarine
- 2 eggs, at room temperature
- 1 1/4 cups buttermilk, warmed to 120°
- 1/2 cup warm water

Make Orange Filling (see below) and set aside. In a large bowl combine yeast, sugar, soda, salt, and 2 1/2 cups flour. Add soft butter and eggs. Add warm buttermilk and warm water and beat at low speed until moistened. Beat on medium speed for 2 minutes. By hand add enough remaining flour (3 to 3 1/2 cups), one cup at a time, to make a soft dough. Turn onto a floured board, cover, and let rest for 5 minutes. Knead until

smooth and elastic. Divide in thirds. Roll each third into a 12" by 7" rectangle. Spread each rectangle with 1/4 of the Orange Filling. Roll up, starting with wide side. Pinch long edge of dough to seal. Cut each roll into 10 slices. Place slices slightly apart on 3 greased 8" or 9" round cake pans, 10 rolls per pan. Cover and let rise until doubled. Bake at 375° for 20 to 25 minutes. While warm frost rolls with remaining filling. **To use buttermilk powder:** Add 5 tablespoons buttermilk powder along with the flour. Omit liquid buttermilk and increase warm water to 1 3/4 cups.

Orange Filling

- 6 tablespoons soft butter
- 2 tablespoons grated orange peel
- 1/4 cup orange juice
- 3 cups confectioner's sugar

Combine all ingredients and beat until smooth and creamy. Divide into 6 equal parts.

Buttermilk Cranberry Bars

- 3 cups flour
- 1/2 teaspoon baking powder
- 1/2 teaspoon soda
- 1/2 teaspoon salt
- 1/2 cup butter
- 1 cup sugar
- 3/4 cup packed brown sugar
- 1/4 cup buttermilk
- 2 tablespoons orange juice
- 1 egg
- 1 cup chopped walnuts
- 2 1/2 to 3 cups coarsely chopped fresh or frozen cranberries
- 1 teaspoon grated orange peel

Sift together flour, baking powder, soda, and salt. Beat butter and sugars in a large bowl until smooth. Stir in buttermilk, orange juice, and egg. Stir in dry ingredients until dough is smooth. Do not overbeat. Fold in nuts, cranberries, and orange peel. Dough will be stiff. Pour into a greased 15" x 10" x 1 1/2" pan. Bake at 350° for 25 to 30 minutes. Frost with Cream Cheese Frosting (below). **To use buttermilk powder:** Add 4 tablespoons buttermilk powder to the dry ingredients and substitute 1/4 cup water for the liquid buttermilk.

Cream Cheese Frosting

- 1 3-ounce package cream cheese
- 1 tablespoon milk
- 2 1/2 cups sifted confectioner's sugar
- 1 teaspoon vanilla

Blend cream cheese with milk. Add sugar and enough milk to make a frosting or spreading consistency. Add vanilla.



Cocoa Fudge Cake

- 1 1/2 cups all-purpose flour
- 1 1/2 cups sugar
- 2/3 cup cocoa
- 1 1/2 teaspoons soda
- 1 teaspoon salt
- 1 1/2 cups buttermilk
- 1/2 cup shortening
- 2 eggs
- 1 teaspoon vanilla

Have ingredients at room temperature. Heat oven to 350°. Grease and flour a 9" x 13" baking pan, or two 8" or 9" layer pans. Sift together dry ingredients in large mixing bowl. Add remaining ingredients. Blend 1/2 minute on low speed, scraping bowl constantly. Beat 3 minutes at high speed, scraping bowl occasionally. Pour into pan(s). Bake oblong pan 35 to 40 minutes, layer pans 30 to 35 minutes, or until wooden toothpick inserted in center comes out clean. Cool. (This recipe also makes 24 cupcakes.) Frost as desired. **To use buttermilk powder:** Add 6 tablespoons buttermilk powder to the dry ingredients and substitute 1 1/2 cups water for the liquid buttermilk.

Zucchini Bread

(made with buttermilk powder only)

- 3 cups flour
- 4 tablespoons buttermilk powder
- 1 teaspoon cinnamon
- 1 teaspoon salt
- 1 teaspoon soda
- 1/2 teaspoon baking powder
- 1 cup oil
- 2 cups sugar
- 3 eggs
- 1 teaspoon vanilla
- 2 cups zucchini, shredded

Preheat oven to 325°. Sift together flour, buttermilk powder, cinnamon, salt, soda, and baking powder. In a mixing bowl, beat oil and sugar until blended. Beat eggs until foamy and add to sugar mixture along with vanilla. Now add the dry ingredients and mix just until smooth. Do not overbeat. Mix in the shredded zucchini thoroughly. Pour batter into two medium well-greased and floured bread pans. Bake for 45 to 50 min-

utes, until breads test done. Let cool for 10 minutes in pans; remove and cool on rack.

Quiche Lorraine

(made with buttermilk powder only)

- pastry for 9-inch pie shell
- 1/2 pound bacon
- 1/2 onion, thinly sliced
- 4 eggs
- 7 tablespoons buttermilk powder
- 1 3/4 cups milk
- 1 teaspoon salt
- pinch of white pepper
- pinch of cayenne
- 1/2 pound Swiss cheese, grated
- 2 ounces Gruyère cheese, grated

Line pie plate with pastry; flute edges to make a standing rim, and chill while preparing filling. Cook bacon until crisp; drain on paper towels and crumble. Sauté sliced onion in a small amount of the bacon fat, cooking only until onion is limp; drain on paper towel. In a mixing bowl combine eggs, buttermilk powder, milk, salt, white pepper, and cayenne, and beat thoroughly with rotary beater until foamy. Arrange crumbled bacon and onion slices in pastry shell. Add Swiss and Gruyère cheeses to form next layer. Pour egg/buttermilk mixture over the cheese. Bake in a preheated 400° oven for 35 to 40 minutes, or until a knife inserted in the center comes out clean. Remove from oven and cool for 10 minutes before serving.

Polly's Buttermilk/Herb Salad Dressing

- 1/2 cup buttermilk
- 1/2 cup mayonnaise
- 1/2 teaspoon dried basil (or 1 1/2 teaspoons fresh basil, chopped)
- 1/2 teaspoon dried dill weed (or 1 1/2 teaspoons fresh dill, chopped)
- dash of Worcestershire sauce
- salt and pepper to taste

Combine all ingredients in a covered jar and shake well to blend, or use a blender. Makes 1 cup. **To use buttermilk powder:** Substitute 2 tablespoons buttermilk powder and 1/2 cup milk for the liquid buttermilk.

Bacon Bits Baked-Potato Topper

(made with buttermilk powder only)

- 1 cup plain yogurt
- 4 tablespoons buttermilk powder
- 1 teaspoon lemon juice
- 4 tablespoons bacon bits
- 1 tablespoon snipped chives
- 1/4 teaspoon seasoning salt

Combine all ingredients and mix well with a wire whip. Refrigerate; use to top hot baked potatoes. Makes 1 cup. □ □

SUBSTITUTIONS FOR COMMON INGREDIENTS

ITEM	QUANTITY	SUBSTITUTE
Allspice	1 teaspoon*	$\frac{1}{2}$ teaspoon cinnamon plus $\frac{1}{8}$ teaspoon ground cloves
Arrowroot, as thickener	$1\frac{1}{2}$ teaspoons 2 teaspoons	1 tablespoon flour 1 tablespoon cornstarch
Baking powder	1 teaspoon	$\frac{1}{4}$ teaspoon baking soda plus $\frac{3}{4}$ teaspoon cream of tartar
Bread crumbs, dry	$\frac{1}{4}$ cup	1 slice bread
soft	$\frac{1}{2}$ cup	1 slice bread
Buttermilk	1 cup	1 cup yogurt
Chocolate, unsweetened	1 ounce	3 tablespoons cocoa plus 1 tablespoon butter or fat
Cracker crumbs	$\frac{3}{4}$ cup	1 cup bread crumbs
Cream, heavy	1 cup	$\frac{3}{4}$ cup milk plus $\frac{1}{2}$ cup melted butter (this will not whip)
Cream, light	1 cup	$\frac{7}{8}$ cup milk plus 3 tablespoons melted butter
Cream, sour	1 cup	$\frac{7}{8}$ cup buttermilk or yogurt plus 3 tablespoons melted butter
Cream, whipping	1 cup	$\frac{3}{2}$ cup well-chilled evaporated milk, whipped; or 1 cup nonfat dry milk powder whipped with 1 cup ice water
Flour, all-purpose	1 cup	$1\frac{1}{4}$ cups cake flour; or $\frac{3}{4}$ cup potato flour; or $1\frac{1}{4}$ cups rye or coarsely ground whole grain flour; or 1 cup cornmeal
Flour, cake	1 cup	1 cup minus 2 tablespoons sifted all-purpose flour
Flour, self-rising	1 cup	1 cup all-purpose flour plus $1\frac{1}{4}$ teaspoons baking powder plus $\frac{1}{4}$ teaspoon salt
Garlic	1 small clove	$\frac{1}{8}$ teaspoon garlic powder or instant minced garlic
Herbs	$\frac{1}{2}$ -1 teaspoon dried	1 tablespoon fresh, minced and packed
Honey	1 cup	$1\frac{1}{4}$ cups sugar plus $\frac{1}{4}$ cup liquid
Lemon	1	1 to 3 tablespoons juice, 1 to $1\frac{1}{2}$ teaspoons grated rind
Lemon juice	1 teaspoon	$\frac{1}{2}$ teaspoon vinegar
Lemon rind, grated	1 teaspoon	$\frac{1}{2}$ teaspoon lemon extract
Milk, whole	1 cup	$\frac{1}{2}$ cup evaporated milk plus $\frac{1}{2}$ cup water; or 1 cup skim milk plus 2 teaspoons melted butter
Milk, skim	1 cup	$\frac{1}{3}$ cup instant nonfat dry milk plus about $\frac{3}{4}$ cup water
Milk, to sour	1 cup	Add 1 tablespoon vinegar or lemon juice to 1 cup milk minus 1 tablespoon. Stir and let stand 5 minutes.
Mustard	1 tablespoon prepared	1 teaspoon dry or powdered mustard
Onion	1 small fresh, chopped	1 tablespoon instant minced onion; or 1 teaspoon onion powder; or $\frac{1}{4}$ cup frozen chopped onion
Sugar, granulated	1 cup	1 cup firmly packed brown sugar; or $1\frac{1}{4}$ cups confectioners' sugar (do not substitute in baking); or 2 cups corn syrup; or 1 cup superfine sugar
Tomatoes	1 cup canned	$\frac{1}{2}$ cup tomato sauce plus $\frac{1}{2}$ cup water; or $1\frac{1}{2}$ cup chopped fresh tomatoes, simmered
Tomato juice	1 cup	$\frac{1}{2}$ cup tomato sauce plus $\frac{1}{2}$ cup water plus dash each salt and sugar; or $\frac{1}{4}$ cup tomato paste plus $\frac{3}{4}$ cup water plus salt and sugar
Tomato ketchup	$\frac{1}{2}$ cup	$\frac{1}{2}$ cup tomato sauce plus 2 tablespoons sugar, 1 tablespoon vinegar, and $\frac{1}{8}$ teaspoon ground cloves
Tomato puree	1 cup	$\frac{1}{2}$ cup tomato paste plus $\frac{1}{2}$ cup water
Tomato soup	1 can (10 $\frac{3}{4}$ oz.)	1 cup tomato sauce plus $\frac{1}{4}$ cup water
Vanilla	1-inch bean	1 teaspoon vanilla extract
Yeast	1 cake, $\frac{3}{5}$ oz.	1 package active dried yeast
Yogurt	1 cup	1 cup buttermilk

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.....

□ YOU MAY OR MAY NOT KEEP them all in one basket, they are difficult to walk on, and you can't make an omelet without breaking them. Although we often think of eggs as symbols of fragility, it is nearly impossible for an adult to break an egg by squeezing it with one hand. Put it endwise between your palms with your fingers interlaced, and it can defy the pressure of both hands. You can even throw it out your second-story window onto the lawn; chances are it will survive.

Egg dropping actually became big news in England in 1970. After a headmaster of a school dropped an egg out of a window to demonstrate its strength, a local fireman climbed to the top of a 70-foot ladder and dropped ten eggs. Seven survived. Then an officer of the Royal Air Force took 18 eggs in a helicopter to a height of 150 feet and dropped them. Only three broke.

The eggshell has a number of other interesting features. In 1863 John Davy of Edinburgh placed one under water and filled it with air under pressure. Bubbles poured out of the shell over its entire surface. He was the first to demonstrate that an eggshell has 6,000 to 8,000 microscopic pores. These pores allow oxygen to pass in and carbon dioxide to pass out as the embryo develops.

When a pullet reaches sexual maturity, some of its roughly 3,600 ova begin to develop into mature yolks one by one. The entire yolk is actually only one cell, one of nature's largest. In fact, an ostrich egg — which according to *The Joy of Cooking* can serve 24 for brunch — is probably the largest cell nature is currently manufacturing.

USEFUL AND SURPRISING FACTS ABOUT EGGS

Such as why egg yolks are yellow, how eggs can remain unbroken when dropped from an airplane, the best way to tell if an egg is fresh, and why unwashed eggs last longer.

by Mark Mikolas

**illustrated by
Bob Johnson**

The hen's oviduct is a sort of egg assembly line about 20 to 30 inches long. Along the assembly line the yolk spends its first three hours in the magnum, where the thick white albumen (egg white) is deposited around it. The hen also performs a tricky maneuver of rotating the yolk while secreting dense cordlike fibers of mucin that are twisted into chalazae at opposite ends of the yolk. These help to anchor the yolk in the middle of the milky albumen. Eggs

are always packed blunt side up because that chalaza is the stronger of the two.

The yolk then continues down the oviduct to the uterus as alternating layers of thick and thin white are added. The egg remains in the uterus about 20 to 21 hours, during which time the inner and outer shell membranes are added and then calcium carbonate creates the shell around the egg.

Within about 30 minutes of an egg's being laid, the next yolk starts its trip down the oviduct until it too comes off the end of the assembly line about 25½ hours later.

All assembly lines require a source of raw materials. Yellow pigment to color the yolk is obtained from the pullets' feed and then stored in their beaks, shanks, toes, vents, eye rings, and in the white of their ear lobes (in white-earlobed breeds).

This pigment is then diverted as needed to the hen's single ovary to color the yolks yellow. The beak, shanks, toes, and so on of a hen that continues to lay become slowly bleached as its store of yellow pigment is used up.

Another raw material required to make an egg is calcium. A good hen

will lay about 300 eggs a year. How does a five-pound bird produce 21 pounds of calcium? It is measured out in its feed, generally in the form of ground oyster shells. If she does not get enough calcium in her diet, the hard-working hen will begin to draw it out of her own skeleton.

Egg coloring is not only an Easter pastime. Some hens color their eggs while they are still in the uterus — these are brown eggs. The color of the shell is strictly a function of the breed of the bird. English birds, such as Rhode Island Reds, lay brown-shelled eggs. Mediterranean birds, like White Rocks and Leghorns, lay white eggs.

Whether producing white or brown eggs, modern-day agricultural Henry Fords are working to make a more streamlined, efficient producer out of the hen. In the early 1800s the average barnyard hen laid about 15 eggs a year. Selective breeding was introduced, and by the turn of the century an average hen was laying about 150 eggs a year.

Today a well-run operation achieves an 85 percent production rate, meaning that each day 85 percent of the hens have produced an egg. That works out to over 300 eggs per year per hen. Genetic researchers at the University of Missouri College of Agriculture managed to coax hen #2988 to lay 371 eggs between August 30, 1979, and August 29, 1980 — a world's record of 1.02 eggs a day for an entire year.

Whether they are brown or white, Pee-wee or Jumbo, have pale or bright yellow yolks, Americans consume an average of 281 eggs per year. That's

down from 313 per capita in 1969, but it still keeps about 285 million hens busy day and night.

You can recognize a fresh whole-some egg by first shaking it. If you feel a rattle, it is not fresh. A top-grade egg, when broken, will stand up firm with very little spreading of the white. Government grades are based on the size of the air cell in the egg, the egg's quality, and its freshness. A Grade AA egg must

be less than ten days old from packing, a Grade A, 30 days.

An old-fashioned but valid test for egg freshness is accomplished by gently dropping a whole uncooked egg into a salt solution (two tablespoons of salt in two cups of water). If very fresh, the egg will be full and heavy and it will sink and tip to one side. If moderately fresh it will remain suspended in the middle of the water in an upright position, and if it bobs up to the top it is stale.

Unwashed eggs, available from some health food stores or local farms, will stay fresh up to six times longer than commercially processed eggs. In fact, if eggs are to be stored or shipped long distance, packers often oil them with a colorless, tasteless mineral oil to seal the egg after the "bloom" — the egg's natural protection — has been washed off.

When you next open a carton of eggs and contemplate their perfection, take a minute to ponder which side of the philosophical fence you prefer. Some of us may stand with Cervantes, who was the first to advise, "'Tis the part of a wise man to keep himself today for tomorrow, and not venture all his eggs in one basket.'" The more daring may



hail Mark Twain and his admonition, "Put all your eggs in one basket and — WATCH THAT BASKET!"

* * *

Tips for cooking with eggs (from *Kitchen Wisdom*, by Frieda Arkin, ©Holt, Rinehart and Winston, 1977)

- If you spill a raw egg where it's difficult to pick up, cover it with salt and let it set; then pick it up with damp paper towels.
- It's easier to separate the yolk from the white if the egg is very cold.
- If eggs are at room temperature before you fry or boil them, the whites will be less likely to be tough. So remove them from the refrigerator a couple of hours before using.
- Avoid beating eggs directly into any hot mixture — they'll curdle. Either cool the mixture first or add small amounts of the hot mixture to the eggs, beating well between additions. After the eggs are fairly well liquefied by the mixture, combine the two and beat again.
- Salt toughens eggs. Add it to egg dishes only after they're cooked.
- Cook all egg dishes at low or moderate heat, otherwise they'll toughen.
- When you serve egg dishes use stainless steel flatware instead of silver. The sulfur in egg yolks discolors silver.

Boiling

- Remove eggs from the refrigerator at least ½ hour before boiling, since very cold eggs may crack when you put them in boiling water.
- If you puncture the rounded end of a cold egg with a pin, it will be less likely to crack when you put it in boiling water.
- If an egg cracks while boiling, immediately pour a large quantity of salt on the crack, lowering the flame first. This will often serve to seal the egg and stop a lot of the white from escaping.
- Plunging hard-boiled eggs into running water while they are still hot will prevent a greenish ring from forming around the yolk.
- You can hard-boil eggs so that the

whites are firm and the yolks thoroughly cooked but still creamy. Place the eggs in a pot, cover with cool water and bring the water to a boil. Cover the pot at once with a tight-fitting lid, turn off the flame and let stand 25 minutes. Eggs cooked in this way are very good for stuffing or slicing.

- You can slice hard-boiled eggs so that the yolks won't crumble if you keep dipping the knife or egg slicer in cold water.
- When you're making stuffed eggs, slice off a tiny piece from the rounded bottom of each hard-boiled half so that when you stuff and arrange them in the dish they'll stand without any trouble.
- To distinguish between a hard-boiled egg with its shell on and an uncooked one, spin it on its end — an uncooked egg won't spin.

Frying

- Fried eggs continue to cook after they've been removed from the pan, so fry them just short of the point you like before sliding them off onto a plate.

Poaching

- Here's how to poach an egg when you have no poacher: bring water with a little white vinegar or lemon juice added (to keep the whites from spreading) to a rolling boil, then lower the flame until the water begins to simmer. Make a whirlpool with a spoon and open the egg into the center of the whirlpool. Move the spoon gently and swiftly around the edge of the pan, keeping the whirlpool going in one direction. Poach for 3 to 3½ minutes. Remove the egg with a perforated spoon.

Scrambling

- For velvety, creamy scrambled eggs, cook them very slowly, starting with a cool buttered pan. Add 1 tablespoon of cream or evaporated milk at the very end. Stir in, and serve.
- Scrambled eggs are always at their most tender if you cook them over hot water in the buttered top of a double boiler. This assures a constant low temperature.



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COMMON STAINS And How to Get Rid Of Them

□ THERE ARE TWO MAIN TYPES OF stains that require basically different cleaning methods:

Greasy stains: On washable materials, pretreat by rubbing in a detergent before washing. Often, however, a grease solvent (cleaning fluid) will be needed, and this will remove the spot just as well after the article has been laundered. Let the material dry and sponge it repeatedly with a cleaning fluid such as carbon tetrachloride. Fabrics with special finishes are apt to hold greasy stains, and persistent effort is required to remove them.

If a yellow stain remains after the solvent has been used on old or heat-set stains, use a sodium perborate or chlorine bleach, or hydrogen peroxide. Sponge nonwashable materials repeatedly with cleaning fluid, allowing them to dry between applications; if a yellow stain remains, use the same bleaches described for washable materials.

Nongreasy stains: On washable materials, some of these stains are removed by laundering while others are set. Play it safe, and always sponge such stains promptly with cool water. Or soak them in cool water for 30 minutes or more, then work undiluted liquid detergent into the stain and rinse. If the stain remains, you will have to use a bleach. On nonwashable materials sponge the stain with cool water or put a sponge under it and squirt cool water through the cloth with a medicine dropper. If this doesn't remove the stain, work liquid detergent into it and rinse. A final sponging with alcohol helps to remove the detergent, and the fabric dries faster.

Common Stains and Their Treatment
Blood. Soak or rub *washable* materials in cold water until the stain is almost

gone, then wash with warm water and a detergent. To old or stubborn stains apply a few drops of ammonia and wash again with detergent.

On *nonwashable* materials sponge the stain with cold or lukewarm water. Sponging with a little hydrogen peroxide usually will remove any final traces of stain. If not, use a sodium perborate or chlorine bleach, depending on the material. Blood stains that have been set by heat are very difficult to remove, but on cottons and linens a warm solution of trisodium phosphate, or Oakite, usually will remove such stains.

Chewing Gum. Choose one of the following methods:

If water does not spot the material, rub the gummy portion with a piece of ice and scrape or rub the gum out of the fabric. This method is very good for carpets and other heavy materials.

Saturate the stain with cleaning fluid, repeating applications as necessary. If a sugar stain remains, sponge it off with water. This method is good for all fabrics and can be used when the material will not wash.

Chlorine. Resin finishes are often applied to cottons, linens, and rayons to convert them to wash and wear, or to give them wrinkle resistance. If you have inadvertently used a chlorine bleach on an article with such a finish, rinse it immediately and thoroughly with water. After rinsing, soak it for half an hour or longer in warm water containing sodium thiosulfate. (Use 1 teaspoon for each quart of water.) For fabrics that will stand it, make the water hot.

An even more effective treatment for white or completely colorfast fabrics is to use a color remover, following the directions on the package.



Cosmetics and Crayon. Apply a liquid detergent directly to the stain if the material is *washable*, or dampen the stain and rub synthetic detergent or soap

into it until thick suds are formed. When the outline of the stain is gone, rinse thoroughly. Repeat as many times as necessary. Sometimes it helps to let the fabric dry between treatments.

Sponge *nonwashable* materials with cleaning fluid repeatedly until no more color can be removed. If a trace remains, work synthetic detergent into it and rinse.

Fruit and Berry. Follow the directions for nongreasy stains. Or, if the material will stand it, stretch the stained part over a bowl, secure it, and pour boiling water on it from a height of 1 to 3 feet.

Always sponge fresh stains promptly with cool water before they have time to become set. Some, such as citrus, are invisible when dry; aging or heating turns them yellow and then they are hard to remove. Never use soap and water first on fruit stains. It may set them. Ironing makes matters worse.



Grass, Flowers, Foliage. Sponging with alcohol will remove most plant stains from washable and nonwashable textiles. Dilute it with two parts of water for acetate, and always test colors first to see if they are affected.

Perspiration. Perspiration tends to weaken textile fibers if allowed to remain on fabrics and to alter or fade the color of dyes. Always wash or sponge off as promptly as possible, using warm water containing a detergent. (Silk is especially sensitive.)

If colors have been changed by perspiration it is sometimes possible to restore them. Sponge fresh stains with ammonia or hold them in the fumes from an open bottle of ammonia. On old stains try vinegar. Rinse carefully with water. If oily traces remain when the fabric has dried, sponge them with cleaning fluid. Cleaning fluids alone will not remove perspiration stains; they must be dissolved with water.

Yellow stains that remain after the treatment with detergent may require use of a sodium perborate or chlorine bleach, or hydrogen peroxide. The strong sodium perborate bleach is often the most effective for fabrics that will stand it.



Scorch. To remove light scorch stains from *washable* materials, follow the directions for nongreasy stains.

Light scorch stains on *nonwashable* materials can be removed by sponging the fabric with hydrogen peroxide. The strong treatment may be necessary. (Test first for colorfastness.) Rinse afterward with plain water.

Scorch stains are almost impossible to remove from silk or woolen materials. Brushing scorched spots on thick woolsens lightly with emery cloth or very fine sandpaper may improve their appearance. Scorch stains cannot be removed if the fibers of the cloth have been burned.

Tar. Stains caused by tar and such tar-like substances as road oil, axle grease, asphalt, asphalt paint, and pitch are similar, and certain solvents are effective for them all. However, they are not easily removed, especially from cotton materials.

Scrape off as much of the substance as possible, then follow the directions for greasy stains. If traces remain, sponge with turpentine. Washables may then be laundered.

For stains on carpets or rugs use this method: scrape off as much as possible with a dull knife, then sponge with a cloth soaked with cleaning fluid. Use a light, upward, brushing motion so that the stain will be rubbed out of the rug rather than into it. Change your cloth when it becomes soiled and continue until the stain is gone.

Excerpted from: *How To Clean Everything*, ©Alma Chesnut Moore, Simon and Schuster, N.Y.

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I made this remarkable discovery when my son went on his first fishing trip with me. We hired this old Indian guide in a small town in Wisconsin.

When our guide showed Mark how to bait his hook, I noticed that he rubbed something on the bait just before Mark put the line in the lake. Within minutes Mark had himself a beautiful bass. You can imagine how pleased I was and Mark, of course, wanted more.

So the whole thing was repeated—the guide put on the bait, rubbed it again, and up popped another beauty. Meanwhile, I sat there patiently waiting for my first fish.

This went on all morning. Mark caught 30 bass and I got eight.

When I pulled the boat in at noon and paid off our Indian guide, I noticed that a small, unusual seed had apparently fallen from the guide's pocket into the bottom of our boat.

The odor from the seed was quite strong and certainly different from anything I had ever smelled before. This was what he had rubbed on Mark's bait!

When we returned home the next day, I gave the seed to a chemist friend of mine. He analyzed it and duplicated it into a spray for me.

I could hardly wait for my next fishing trip. What I discovered on that trip was absolutely unbelievable. I have never before caught fish like that. Every time I baited my hook, I sprayed it and up popped another fish.

I tested some more. I put spray on one bait and nothing on another. The sprayed bait got the fish almost immediately. The unsprayed bait got some nibbles, but nothing more.

I gave some of my friends samples of the spray to try and the results were the same—they caught fish like never before.

I named my spray "CATCH FISH LIKE CRAZY" cause that's just what it does and it works with all kinds of fresh or salt water fish. It works equally well on artificial or live bait.

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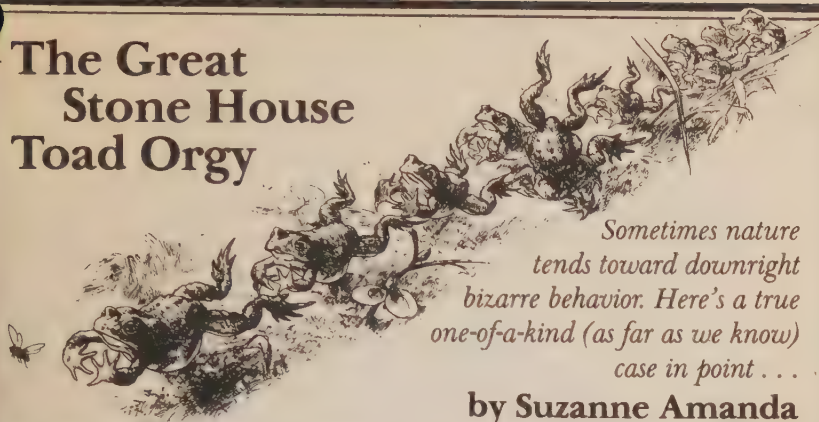
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The Great Stone House Toad Orgy



*Sometimes nature
tends toward downright
bizarre behavior. Here's a true
one-of-a-kind (as far as we know)
case in point . . .*

by Suzanne Amanda

□ IN THE SOUTHWEST CORNER OF our Connecticut property is a doughnut-shaped depression which in a rain storm fills with water, making a small pond.

The year we moved here to The Stone House, I was delighted to discover toads near the edges of the pond. Little did I know that over the next few years the toads would be the main characters in a fascinating drama.

That first spring the children and I watched the male toads puff their white throats to give their shrill mating call (my daughter learned to imitate the sound) and, in time, the pond was dotted with masses of jelly-like eggs. During the next weeks, the children checked the pond daily, entranced as the eggs became polliwogs; and then the polliwogs grew little legs and lost their tails and finally became miniature toads. By this time the pond was nearly dry and the toads left. We would see them in the flower garden catching insects or along the foundation of the house.

The following spring, after the ice and snow melted and the heavy rains of April fell, the pond once again was full. The weather grew warm and one fine moonlit night we heard a lone toad give his high love call. The next night there were two toads, and then a whole population of them. We watched the cycle repeat itself — the mating, the eggs, the polliwogs.

In the succeeding years there were more and more toads. I did not think much of the increasing numbers until it became difficult to mow the lawn. Robins and bluejays now began to gather at the pond in the spring to dine on the polliwogs, yet the toads continued to proliferate. Soon we began to notice more and more snakes in the yard, attracted by the prospect of toads for dinner.

Despite the preying of snakes and birds, the toad population continued to increase. Our next-door neighbor walked over to complain of the noise of the mating toads. "You should fill the pond in," he said. "My wife can't sleep." We took bucketsful of polliwogs from the pond and carried them down the road to a nearby lake, but I was reluctant to interfere much more than that. When we had first moved to The Stone House, there was nothing unusual about the number of toads on our land. Now, several years later, the density of the population was, I thought, unusual, and something would have to happen.

The next spring the mating began as usual with the initial call of one lone, lusty male and then a gathering of many toads. Although the number of toads was phenomenal, there was no indication that the cycle would be much different from previous years. There would, I supposed, be days of mating, masses of eggs, and after the

polliwogs dropped their tails, the lawn would be overtaken by toads. We were soon surprised.

Early one morning about eight o'clock, the children, always the first to discover a change in the activities of the pond, came running into the house urging me outside. Arriving at the water's edge, I saw that the pond was literally covered with toads.

"They're drowning each other, look," my daughter said. The toads were mating, the males on the backs of the larger females, ribbons of eggs leaving the females' bodies. We had seen this in previous years. But now, for most of the females there were two males. "An orgy," I thought to myself in disbelief. I sat on the bank and watched for a few minutes. The kids were right. The females were being held under the water, and it appeared many of them were indeed drowning.

I looked around the pond. There were hundreds — I want to say thousands — of toads, most of them engaged in mortal threesomes. What was

taking place was, I was sure, nature's way of dealing with the over-population. The orgy went on all day. In amazement, I kept going outside and standing on the banks to watch in horrified fascination.

The following morning I awoke to the gravelly cawing of crows and went out to the pond. Dead toads floated, white bellies up, on the surface of the water. The crows were eyeing the breakfast feast awaiting them. Whether all of the toads died, or the males marched off in a midnight migration, I don't know, but there were few live ones left around the pond that morning. Except for the clean-up work of the crows, the drama of the toads had ended.

We still have toads; there are still eggs and polliwogs in the spring, but the population has never been as great as it was nor does it appear to be increasing. It is unlikely that we will witness another toad orgy, but then, how many people have witnessed even one? □□

ANSWERS TO RAINY DAY AMUSEMENTS

(from page 165)

Boxful: 1) Sandbox, 2) Man overboard, 3) I understand, 4) Reading between the lines, 5) Long underwear, 6) Crossroads, 7) Downtown, 8) Tricycle, 9) Split level, 10) Three degrees below zero, 11) Neon lights, 12) Circles under the eyes, 13) High chair, 14) Paradise, 15) Touchdown, 16) Six feet under ground, 17) Mind over matter, 18) He's beside himself, 19) Backwards glance, 20) Life after death, 21) G.I. overseas, 22) Space program, 23) See-through blouse, 24) Just between you and me.

Pesky Exchange: Mesquite becomes Mosquito

Common Interest: Each word contains three consecutive letters of the alphabet: DEForm, caLM-Ness, firST, STUmp.

Nicknames: 1) Jimmy Durante, 2) Eddie Cantor, 3) Judas or Benedict Arnold, 4) Andrew Jackson, 5) Rudolph Valentino, 6) Napoleon, 7) Louis Armstrong, 8) John Wayne 9) Abraham Lincoln, 10) Paul Whiteman.

Saddle Up: 1)E, 2)G, 3)L, 4)H, 5)K, 6)Q, 7)P, 8)S, 9)T, 10)I, 11)N, 12)A, 13)J, 14)B, 15)M, 16)F, 17)R, 18)O, 19)C, 20)D.

Number Games: 1) Your answer should be 65 — the age you will start collecting social security. 2)

You should have the year President Ronald Reagan was born. 3) If you calculated correctly you have the year of the great or not so great (depending on your political persuasion) budget cut.

Animal Adjectives: 1) hawklike, 2) snakelike, 3) gooselike, 4) eaglelike, 5) asslike, 6) goatlike, 7) deerlike, 8) kingsnakelike, 9) mongooselike, 10) goatlike — especially in strong odor or lustfulness, 11) lizardlike, 12) lemurlike, 13) otterlike, 14) mouselike, 15) songbirdlike, 16) sheeplike, 17) perching-songbirdlike, 18) peacocklike, 19) froglike, 20) hoglike, 21) swinelike, 22) bull-like, 23) bearlike, 24) viperlike, 25) foxlike.

Matching Fears: Acrophobia — fear of heights, Algophobia — fear of pain, Agoraphobia — fear of open places, Androphobia — fear of men, Anthophobia — fear of people, Autophobia — fear of being alone, Ceraunophobia — fear of thunder, Claustrophobia — fear of enclosed places, Decidophobia — fear of making decisions, Gynophobia — fear of women, Hematophobia — fear of blood, Nyctophobia — fear of nights, Omophobia — fear of rain, Pantophobia — fear of fears, Peccatophobia — fear of sinning, Ponophobia — fear of work, Psychophobia — fear of cold, Sitophobia — fear of food, Sophophobia — fear of learning, Verbophobia — fear of words. A score of 12 to 15 is good; 16 to 18, excellent; 19 to 20, impossible.

GESTATION AND MATING TABLE

	Proper age for first mating	Period of fertility, in years	No. of females for one male	Period of gestation, in days	
				Range	Average
Ewe	90 lbs. or 1 yr.	6		142-154	147 151 ^a
Ram	12-14 mos., well matured	7	50-75 ^a 35-40 ^b		
Mare	3 yrs.	10-12		310-370	336
Stallion	3 yrs.	12-15	40-45 ^a Record 252 ^a		
Cow	15-18 mos. ¹	10-14		279-290 ^a 262-300 ⁷	283
Bull	1 yr., well matured	10-12	50 ^a Thousands ^a		
Sow	5-6 mos. or 250 lbs.	6		110-120	115
Boar	250-300 lbs.	6	50 ^a 35-40 ^b		
Doe goat	10 mos. or 85-90 lbs.	6		145-155	150
Buck goat	Well matured	5	30		
Bitch	16-18 mos.	8		58-67	63
Dog	12-16 mos.	8			
She cat	12 mos.	6		60-68	63
Doe rabbit	6 mos.	5-6		30-32	31
Buck rabbit	6 mos.	5-6	30		

¹Holstein & Beef: 750 lbs. Jersey: 500 lbs. ²Handmated. ³Pasture. ⁴Natural. ⁵Artificial. ⁶Beef: 8-10 days shorter for Angus. ⁷Dairy. ⁸For fine wool breeds.

BIRD AND POULTRY INCUBATION PERIODS, IN DAYS

Chicken ... 21	Goose ... 30-34	Guinea ... 26-28
Turkey ... 28	Swan ... 42	Canary ... 14-15
Duck ... 26-32	Pheasant 22-24	Parakeet 18-20

GESTATION PERIODS, WILD ANIMALS, IN DAYS

Black bear ... 210	Seal ... 330
Hippo ... 225-250	Squirrel, gray ... 44
Moose ... 240-250	Whale, sperm ... 480
Otter ... 270-300	Wolf ... 60-63
Reindeer ... 210-240	

LONGEVITY IN CERTAIN ANIMALS IN YEARS

Ass ... 24	Cow ... 18	Lion ... 15-29
Bat ... 6	Deer ... 17	Monkey ... 7
Bear, Black ... 19	Dog ... 16	Moose ... 8
Bear, Grizzly ... 31	Elephant ... 47	Pig ... 14
Bear, Polar ... 31	Fox ... 8	Rabbit ... 5
Beaver ... 13	Goat ... 9	Sheep ... 13
Buffalo ... 20	Gorilla ... 25	Squirrel ... 8
Cat (domestic) 15	Guinea Pig ... 4	Whale ... 37
Chimpanzee ... 30	Horse ... 27	Wolf ... 12
Chipmunk ... 7		

REPRODUCTIVE CYCLE IN FARM ANIMALS

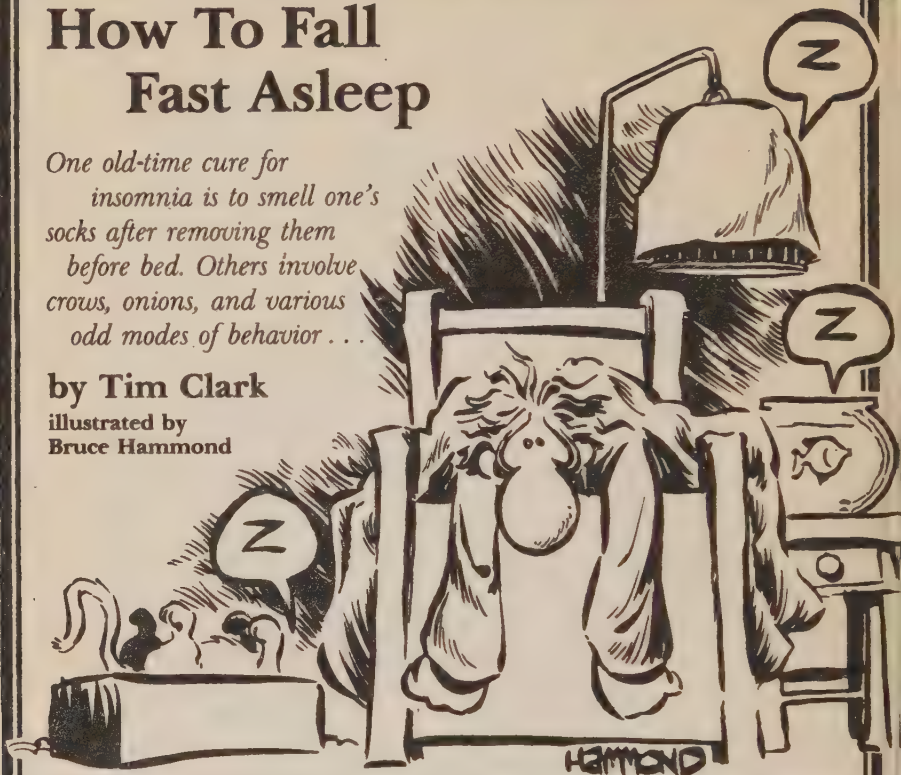
	Rekurs if not bred	Estrual cycle incl. heat period (days)		In heat for		Usual time of ovulation
		Days	Ave. Range	Ave.	Range	
Mare	21	21	10-37	5-6 days	2-11 days	24-48 hours before end of estrus
Sow	21	21	18-24	2-3 days	1-5 days	30-36 hours after start of estrus
Ewe	16½	16½	14-19	30 hours	24-32 hours	12-24 hours before end of estrus
Goat	21	21	18-24	2-3 days	1-4 days	Near end of estrus
Cow	21	21	18-24	18 hours	10-24 hours	10-12 hours after end of estrus
Bitch	pseudo-pregnancy	24		7 days	5-9 days	1-3 days after first acceptance
Cat	pseudo-pregnancy		15-21	3-4 days if mated	9-10 days in absence of male	24-56 hours after coitus

How To Fall Fast Asleep

One old-time cure for insomnia is to smell one's socks after removing them before bed. Others involve crows, onions, and various odd modes of behavior . . .

by Tim Clark

**illustrated by
Bruce Hammond**



□ NAPOLEON BONAPARTE COULD not do it. Winston Churchill had problems. Charles Dickens and Franz Kafka had to get into unusual positions to achieve it. The Earl of Rosebery had to resign as Prime Minister of England because he couldn't do it. And Thomas Edison hardly did it at all.

What these famous people and up to 50 million modern-day Americans have found difficult or impossible is the simple, natural act of falling asleep. Insomnia, an ailment as old as mankind, is little understood even today, after three decades of vigorous and ground-breaking research into the nature of sleep.

Insomnia is defined by most researchers as an inability to sleep that interferes with efficient daytime functioning. In other words, it's not how much you sleep that makes you an in-

somniac, but how well you function when you're awake. Some people can get along very nicely on as little as three or four hours of sleep a night. They may even complain of needing more sleep because we've all heard that we need eight hours a night. It's just not true for everyone. Edison, who rarely got what we call "a good night's sleep," performed very efficiently on a few naps, especially after a particularly troublesome problem had been solved.

But we can't all be like Edison, and chronic insomnia can be devastating. An insomniac understands too well why sleep deprivation is a favorite form of torture. It explains why sleeping pills are, after aspirin, the most commonly used drugs in the United States, with an estimated 30 million tablets swallowed before bed *every night*.

And yet, paradoxically, misuse of sleeping pills is one of the leading causes of insomnia, in addition to a variety of other ills, including drug dependence.

It is comforting, however, to learn that the latest scientific methods for inducing sleep are not so different from the tried and true. Indeed, the recommendations of modern sleep experts for improved "sleep hygiene" — or how to fall asleep — have a familiar ring to them.

Take counting sheep, for example. This ancient and reliable method — some old-timers prefer to imagine crows circling in the sky — draws support from current-day sleep researchers who cite recent discoveries about the nature of the brain to explain the success of counting sheep. The human brain is divided into two hemispheres whose functions are different. The right side of the brain is chiefly concerned with visual images, the left side with speech and counting. Counting sheep puts both sides of the brain to work, providing enough distraction from worries or other intrusions to allow sleep to sneak up on our consciousness. In modern sleep clinics similar techniques are recommended to patients with problems falling asleep — they are urged, for example, to imagine writing the numbers 1 to 100 on a blackboard.

Another unusual approach is called "paradoxical intention." People who have trouble sleeping are instructed to try as hard as they can to stay awake at night (without using drugs or caffeine). In laboratory experiments where insomniacs were ordered to stay awake for 30 minutes, many of them fell asleep almost immediately. Conversely, when the sleeping subjects were called over an intercom at the end of the 30 minutes and told it was all right to go to sleep now, many of them woke up and were unable to go back to sleep.

A psychologist named Richard Bootzin developed a therapy called "stimulus control" for people who

have grown to associate insomnia with being in bed. It is a demanding process, requiring the patient to stay out of bed except when sleepy. That means no watching TV, reading, knitting, or any other nonsleeping behavior (except sex). If the patient can't fall asleep within ten minutes of getting into bed, he has to get up and go to another room until he feels sleepy. Then he goes back to bed and, if necessary, repeats the process until he falls asleep within the allotted ten minutes. Regardless of how many times he has to get up, he must rise for the day at exactly the same time every morning, avoid daytime naps, and keep a careful written record of the number of times he had to get up before falling asleep.

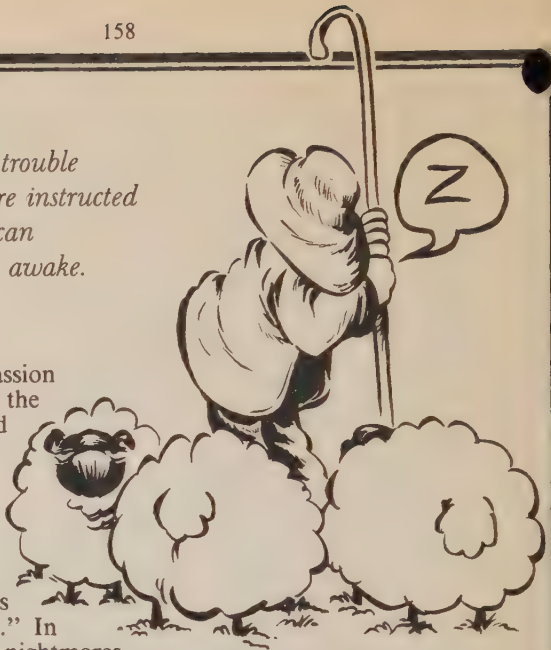
With most patients the immediate effects have been horrible — the sleeper gets out of bed as many as ten times the first night. But after a few weeks the anti-bed conditioning begins to weaken and within six weeks most patients, even insomniacs who haven't had a full night's sleep in ten years, are sleeping through the night.

Another familiar folk remedy is a glass of warm milk just before retiring. A book published in 1430 testified to the effectiveness of the method: "She gave him milke, (and) ye slepe fell in his hede." Now scientists have discovered that milk contains a substance called L-tryptophan, which is chemically related to a substance in the brain called serotonin. Serotonin appears to increase in the brains of sleeping animals, and injections of serotonin into waking animals' brains put them to sleep.

There is some disagreement, however, on whether a glass of milk before bedtime would give a human being enough L-tryptophan to do any good — some skeptics claim you would have to drink six or seven glasses to get an effective dose — more than enough to wake you up a few hours later for obvious reasons.

A number of herbal teas have been put forward as sleep-inducing, includ-

*People who have trouble
sleeping are instructed
to try as hard as they can
to stay awake.*



ing camomile, boneset, passion flower, and catnip, which the late Euell Gibbons claimed would prevent nightmares. An English herbalist of the 17th century recommended tying the dried root of the peony around one's neck to ward off "the Incubus which we call the Mare." In those days people thought nightmares were caused by goblins that sat on a sleeper's chest, threatening him with suffocation. An old New England folk cure for nightmares was to smell your socks after taking them off before bed. Some might prefer suffocation.

Eating before bedtime has long been associated with bad dreams and troubled sleep. "Those who indulge in late suppers, or eat heartily before retiring, are usually troubled with unpleasant dreams, nightmares, and are often found dead in the morning," a 19th-century herbalist warned gravely. But modern researchers agree that it is better to have a light snack before bedtime than to go to bed hungry. Laboratory rats deprived of food slept less, and in humans severe dieting and loss of sleep seem to go hand in hand. One English folk remedy for insomnia recommends eating onions, preferably raw, but stewed or made into soup or jelly is also fine.

All authorities agree that you should stay away from caffeine, a stimulant found in coffee, tea, chocolate, cola drinks, and many over-the-counter pain relievers and cold remedies. Caffeine is the most widely used stimulant

in the country, and studies have shown that it will disturb sleep even in persons who believe that it does not affect them. Nicotine has a similar effect.

Drinking in moderation, however, does tend to promote drowsiness. Heavy drinking has the unpleasant consequence of canceling out the normal periods of dreaming. When the drinking stops, the dreaming comes back for longer, more intense periods, often in the form of nightmares.

Nightmares also seem to increase as the temperature of the bedroom gets colder, contrary to the folk wisdom that it is easier to sleep in a cold room. But too warm a room also disturbs sleep — a cat will sleep longer with the temperature around 72 degrees Fahrenheit, but humans move around more when it reaches 75 degrees and have less refreshing sleep.

It hardly seems surprising that loud noises tend to wake people from sleeping, but scientists have devoted much study to the effects of noise on sleepers. In general they have found that women and older people are awakened more easily, although the sensitivity to noise varies greatly from one individual to

another. Interestingly, a loud noise is less likely to awaken a sleeper who incorporates that noise into the content of his or her dream. And the specific meaning of a noise can make a big difference — a mother who sleeps soundly through a thunderstorm may awaken instantly when her baby starts to cry, however faintly.

Another bit of folk wisdom about sleeping is the belief that sleep is promoted by lying so that the head points north, in line with magnetic currents (one variation on this is the belief that one's head should be pointed east so that, as the earth turns, one is propelled through space headfirst). Charles Dickens was always careful to get himself properly oriented with his head to the north before sleeping, and another writer, Franz Kafka, used to cross his arms and put his hands on his shoulders to make himself "heavier." But sleep research has not yet shown body positioning, curvature of the spine, or the type of bedding to be significant in determining how well or how quickly one will sleep.

Yet another famous author, the Frenchman Alexandre Dumas, was ordered by his doctor to eat an apple under the Arch of Triumph every morning at 7 A.M. exactly. This was a scheme to make Dumas observe regular hours, which scientists today agree will help one sleep. Dumas's sleeping problems might have had something to do with his estimated 500 illegitimate children, however.

Between walking to the Arch of Triumph in the morning and hiking up the French population growth in the evening, it would seem that Dumas got plenty of exercise. But he got it at the wrong times. The latest studies indicate that regular exercise, while helping one to sleep well, is most beneficial in the afternoon or early evening, and violent exertions at bedtime are more likely to keep one awake. As Florence

Nightingale observed, "Sleeplessness in the early night is from excitement generally."

That's why the authorities agree that one should avoid too much mental or emotional stimulation just before bedtime. Reading or watching TV is fine, but not if the subject matter is likely to get your heart pounding and adrenaline pumping. Don't do your income taxes or talk about your in-laws. And if you don't fall asleep right away and feel yourself getting tense and frustrated, get up and do something else. Ben Franklin advocated a brisk walk around the bedroom as well as a thorough airing of the bedclothes, shaking them at least 20 times. He did not mention the effect of this on his bed partner.

"These are the rules of the art," Franklin concluded in a letter to a lady who had asked him how to avoid unpleasant dreams. "But, though they will generally prove effectual . . . there is a case in which the most punctual observance of them will be totally fruitless. The case is when the person who desires to have pleasant dreams has not taken care to preserve what is necessary above all things, A Good Conscience."

□□



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THE OLD FARMER'S ALMANAC

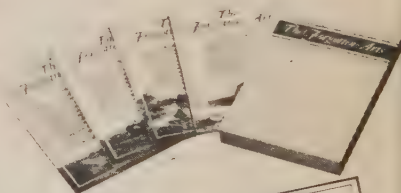
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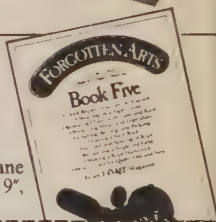
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Old Farmer's Almanac 1983

Old And New Mathematical Puzzles

Blanton C. Wiggin, Puzzle Editor

For 1983, we have 15 classical, original, and timely puzzles. They are graded for difficulty so that there should be something of interest for everyone. We hope you find them challenging. No calculus, computers, or tricks. We try to include specialized knowledge, if needed, in the puzzle statement.

We will award one prize of \$50 for the best set of solutions to puzzles 12 through 15 received before March 1, 1983. The answers to these four are omitted here.

We use a point system to judge the prize set. A basic, unadorned, correct answer is 20 points. For a thorough analysis, an elegant or novel answer, up to 5 points extra. Numerical errors lose only 2 or 3 points if the method is understood.

Explanations and Prize-Set Answers will be sent after April 1 to anyone sending 50¢ and a self-addressed stamped business envelope to "Puzzle Answers," *Old Farmer's Almanac*, Dublin, NH 03444.

We'll pay \$15 for any original puzzles we use in the 1984 *Old Farmer's Almanac*. Closing date for submission is March 1, 1983. Entries become the property of Yankee Publishing Incorporated and cannot be acknowledged or returned. In addition to submitting a puzzle, please tell us the type of puzzle you like best, such as magic squares, geometry, time-rate-quantity, mazes, logic, number substitutions, etc.

In 1982 we had a new winner, Arthur R. Loepp, Kansas City, Missouri. He had 88.5 points, closely followed by Paul Aitkenhead, Somerville, Massachusetts, and Major William Hedberg, Engineering Department, West Point, New York. There were two 24.5-point answers.

Please submit your favorite puzzles and send your answers early for puzzles 12-15. Use a separate sheet for each puzzle or answer, and be sure each sheet has your name and address. Good luck!

(Answers to 1983 puzzles are on page 164.)

1. One-Way Cow

(Difficulty: 1)

A farmer has a cow that will not back up or turn around. He has 100 feet of rope and a stake. His barn is 50 feet square. The farmer wants to go to town for the day, but he wants to stake the cow outside the barn so it can eat all the

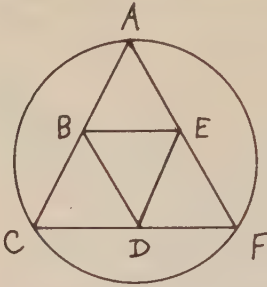
way around the building while he's gone. How can he do this?

Cathy Hines, Chillicothe, Oh.

2. One-Way Path

(Difficulty: 1)

Draw this picture without taking your pen from the paper, without going



over the same line twice, and without crossing a line.

Vania M. Ansley, Morden, Manitoba

3. The Motorized Farm

(Difficulty: 1)

How many vehicles does Farmer Perkins have, if all but two are pickups, all but two are tractors, and all but two are snowmobiles?

Mary Ann Scholten, Warner, N.H.

4. Amateur Arbitrageur

(Difficulty: 2)

On the Vermont-Quebec line lived a bright young lad in the days when the American and Canadian dollars were at par. If the bank discounts were a penny each way, he would walk into Rock Island, Quebec, buy a piece of penny candy, give the storekeeper a Canadian bill and ask for an American dollar, worth C\$0.99, in change. Then he'd walk back to the candy store in Derby Line, Vermont, where he repeated, getting a Canadian dollar worth US\$0.99 in change. He would do this until he was sick, and he would still have a dollar in his pocket. Neat trick. Perpetual motion? What is the fallacy?

Allen Jenkins, Braintree, Mass.

5. Slow Flyer

(Difficulty: 2)

Jim is flying his plane from Greenville to Redburg, 60 miles away. His airspeed is 100 mph. When he sets out there is a 20-mph tail wind, but at the 30-mile mark it shifts to a 20-mph head wind. What is his average speed for the entire trip?

Bill MacCartney, Ashby, Mass.

6. Calendar Correction

(Difficulty: 3)

Four hundred years ago, average planting and harvest times had drifted about 10 days from their intended dates due to the unvarying, steady leap-year pattern of the old Julian calendar of Caesar. To correct this, October 5, 1582, became October 15, 1582, new style. Thus 1583 was the first full year of the new Gregorian Calendar, which would omit 3 leap-year days every 400 years, and 1983 marks the beginning of the 2nd complete Gregorian cycle.

a. Just before the correction, was Sirius, the dog star, rising and moving across the sky sooner or later in the year than anticipated by Caesar's astronomers?

b. If the sun year were to remain exactly 365.2422 days long, when would the Gregorian calendar be 10 days off?

Donald Chesley, New York, N.Y.

7. Eatin' Finches

(Difficulty: 3)

A mother goldfinch asked her hungry fledglings how high they thought their nest to be. They were busy stuffing themselves, and one carelessly answered so many feet and inches.

Actually, he inadvertently mixed up the feet and inch digits and gave an answer only 30% of the actual height. Fortunately, momma corrected her chicks so that on their first flights they landed on their feet.

How high was the nest?

This may explain why fresh finch eaters prefer their feet to meters!

Ed Lambert, North Quincy, Mass.

(Courtesy of *New England Engineering Journal*)

8. Locker Inspection

(Difficulty: 3)

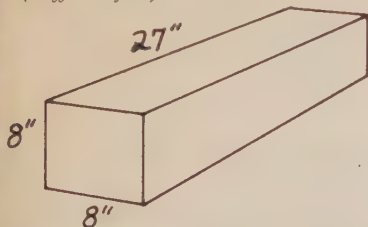
At Antioch High there are 1,000 students who each have a closed locker. The lockers are numbered 1 to 1,000. Then one student opens every locker. A second student then closes every second locker. The third student changes the state of every third locker: if it is open he closes it, and vice versa. A

fourth student changes every fourth locker. This continues until the thousandth student changes the state of the thousandth locker. At this point which lockers are open?

R. L. McCarley, Lake Villa, Ill.

9. Coping With a Cube

(Difficulty: 4)



What minimum cuts would you make in a full-sized 8"x8"x27" timber to reassemble the pieces into a cube? Choose any kind of saw, and ignore blade thickness.

Gardner Pierce, Worcester, Mass.

10. Fractured Fractions

(Difficulty: 4)

There are some common fractions (equaling less than 1) with two-digit numerators and two-digit denominators that have a common digit in both. One such is $19/95$. Removing the common digit leaves $1/5$, which equals $19/95$. Name another three of these fractions.

Hollie L. Buchanan, Vienna, W. Va.

11. Alphameric Threesome

(Difficulty: 4)

a. By substituting six different digits for the six different letters, can you make

$$\begin{array}{r} \text{TWO} \\ \times \text{ TWO} \\ \hline = \text{THREE} \end{array} \quad ?$$

b. With a different set of substitutions, can you change

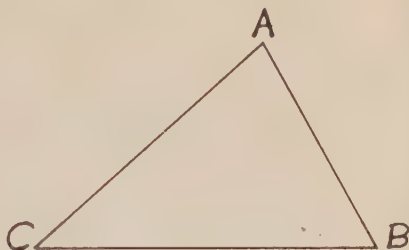
$$\begin{array}{r} \text{ADAM} \\ \text{AND} \\ \text{EVE} \\ \text{ON} \\ + \text{ A} \\ \hline \text{RAFT} \end{array}$$

into a correct sum?

Pamela Reetz, Maysville, Ky.

12. Trisecting the Triangle

(Difficulty: 5)



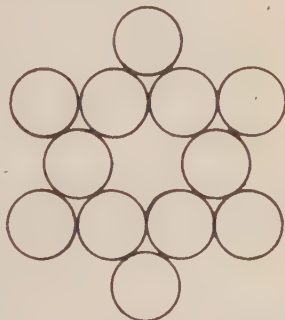
The classic Greek problem of trisecting the angle is impossible (#15, OFA 1981), but trisecting the triangle into three equal areas (not using the medians) is perfectly possible, using only an unmarked straightedge and compass separately. No approximations, curves, special aids, limits, or 60° and 90° triangles.

Please show your construction in clear steps with basis or theorem cited, supporting each step or conclusion.

William E. Lindstrom, Andover, Mass.

13. Six-Pointed Magic Star

(Difficulty: 5)



Arrange the numbers 1 through 12, one to a circle, so that 26 is the total of the numbers in

- each of the six 4-circle straight lines,
- the six points of the star, and in
- each of the four corners of the

three 8-circle diamonds.

Rotations and mirror images excluded, is there more than one unique arrangement?

A. Wickwire, Pelham, N.H.

14. Number Maze II

(Difficulty: 5)

The numbers in this series seem to bounce around:

43, 171, 57, 19, 75, 25, 99, 33, 11, 45, 15, 5, 21 ...

a. What are the rules for this series?

Does the series end somewhere? If so, where? If not, why not?

b. What is the lowest number above 3 which repeats? In short, can you find your way out of this number maze?

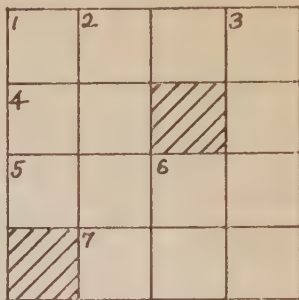
Davis Spencer, Weston, Mass.

15. 1983 Cross-Number Logic

(Difficulty: 5)

This is similar to a crossword puzzle except that the definitions are not numbered. You have to figure out both the clue and where it goes:

a. A factor of another number in the puzzle.



b. One more than a multiple of the sum of the 14 digits in the puzzle.

c. A perfect square plus one.

d. The last prime-number year plus four.

e. The smallest number in the puzzle.

f. Also a prime number when turned upside-down.

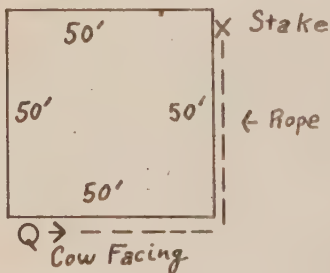
g. The puzzle's only composite number is not this.

h. No clue needed.

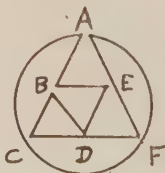
Bob Lodge, Seattle, Wash.

ANSWERS TO PUZZLES ON PAGES 161-163

(1) Put the stake 100 feet *ahead* of the cow.



(2) ABEDBCDFEAFCA.



(3) Three: one of each.

(4) No fallacy; no perpetual motion. For practical considerations, see Introduction and send for puzzle answers.

(5) 96 mph. not 100.

(6) a. Sooner by the calendar; same time by the sun.

b. About May 1, A.D. 34915!

(7) 9'2".

(8) The lockers whose numbers are squares: 1, 4, 9, 16, etc.

(9) Flat-blade or circular saw, 4; coping or jigsaw, 2.

(10) 16/64, 26/65, and 49/98, for example.

(11) a. An answer: $138 \times 138 = 19044$.

b. An answer: $5758 + 597 + 121 + 49 + 5 = 6530$.

(12)-(15) Prize set. See instructions, page 161.

Rainy Day Amusements

(answers on p. 154)

PUZZLES BY THE BOXFUL

by Thomas E. Oetzel

Test your common sense. In the following quiz try to determine what the words in each square mean. For example, in square one, the answer is sand-box.

1	2	3	4
SAND	MAN BOARD	STAND I	R/E/A/D/I/N/G
5	6	7	8
WEAR LONG	R ROADS A D S	T O W N	CYCLE CYCLE CYCLE
9	10	11	12
LE VEL	O M P H D B S	KNEE LIGHTS	III OOOO
13	14	15	16
CHAIR	DICE DICE	T O U C H	GROUND FEET FEET FEET FEET FEET
17	18	19	20
MIND MATTER	HE'S/HIMSELF	ECNALG	DEATH/LIFE
21	22	23	24
G J C C C C	— PROGRAM	B O O K S	J Y O U M E S T

A PESKY LITTLE EXCHANGE

by S.G. Hall

I grow by streams
down Texas way
And I'm so spelled
that if, for play
You'd change to "o"
my every "e"
A downright pest
is what I'd be.
What's my name?

A COMMON INTEREST

by Brian McFarland

What do the following words have in common: DEFORM, CALMNESS, FIRST, STUMP?

FAMOUS NICKNAMES

by Agnes Kempton

How well do you know famous people? Can you substitute the actual names for the nicknames of the famous people given below?

1) Schnozola, (2) Banjo Eyes, (3) The Betrayer, (4) Old Hickory, (5) The Sheik, (6) The Little Corporal, (7) Satchmo, (8) The Duke, (9) The Great Emancipator, (10) King of Jazz.

SADDLE UP

by Louis Haslev

These famous horses and their riders have appeared in film, fiction, and history. Match the appropriate horse and rider.

- | | |
|------------------|--|
| 1. Babieca | A. Don Quixote |
| 2. Barbary | B. Ken Maynard |
| 3. Black Bess | C. Shakespeare's Richard III |
| 4. Black Nell | D. Pecos Bill |
| 5. Borak | E. The Cid |
| 6. Brigham | F. Gen. Robert E. Lee |
| 7. Bucephalus | G. Shakespeare's Richard II
(also Henry IV) |
| 8. Champion | H. Wild Bill Hickok |
| 9. Copenhagen | I. Sir Gawain |
| 10. Gringolet | J. Odin |
| 11. Pegasus | K. Mohammed |
| 12. Rozinante | L. Dick Turpin |
| 13. Sleipmir | M. Tom Mix |
| 14. Tarzan | N. Bellerophon |
| 15. Tony | O. Gen. George Custer |
| 16. Traveler | P. Alexander the Great |
| 17. Trigger | Q. Buffalo Bill Cody |
| 18. Vic | R. Roy Rogers |
| 19. White Surrey | S. Gene Autry |
| 20. Widow-Maker | T. Duke of Wellington |

A NUMBER OF NUMBER GAMES

by Fredrick John

The following collection of number games may not make you a financial wizard, but they should help you remember your telephone number the next time you dial it.

1) *Your Social Security Number:* 1. Take the last four digits of your Social Security number, and double them. 2. Then multiply by two. 3. Add 260. 4. Divide by four. 5. Take away the last four Social Security digits.

2) *President Ronald Reagan*: 1. Pick any three numbers. The first and the last must be different. 2. Reverse this number, and subtract the smaller from the larger. 3. Reverse your new total. 4. Add the new total and the reversed figure together. 5. Add 822. (Be sure to count any zeroes that may appear in your calculations. Example: 302 minus 203 equals 099. When reversed, 099 becomes 990.)

3) *The Year of the Great Budget Cut*. 1. Write down the year you were born. 2. Write down an important historic year during your lifetime. 3. Next, put down the number of years that have elapsed since the historic year. 4. Put down your age this year on your birthday. 5. Add up the numbers on your list. 6. Divide by two, then subtract one.

THE ADJECTIVE OF THE ANIMAL

by Lynne Tieslau Jewell

All of the following adjectives are used to describe animal-like qualities. A few are obvious, like bovine ("cow-like"), but many others are not. How many of the following adjectives can you associate with the appropriate animal?

1) accipitrine, 2) anguine, 3) anserine,

4) aquiline, 5) asinine, 6) caprine, 7) cervine, 8) colubrine, 9) herpestine, 10) hircine, 11) lacertine, 12) lemurine, 13) lutrine, 14) murine, 15) oscine, 16) ovine, 17) passerine, 18) pavonine, 19) ranine, 20) suilline, 21) suine, 22) taurine, 23) ursine, 24) viperine, 25) vulpine.

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MATCHING FEARS

by Thomas E. Oetzel

Just match the word with the meaning, unless, of course, you have *decidophobia*.

Acrophobia	fear of enclosed places
Algophobia	fear of people
Agoraphobia	fear of blood
Androphobia	fear of sinning
Anthrophobia	fear of cold
Autophobia	fear of heights
Ceraunophobia	fear of words
Claustrophobia	fear of work
Decidophobia	fear of open places
Gynephobia	fear of pain
Hematophobia	fear of thunder
Nyctophobia	fear of fears
Ombrophobia	fear of food
Pantophobia	fear of men
Peccatophobia	fear of rain
Ponophobia	fear of making decisions
Psychrophobia	fear of women
Sitophobia	fear of being alone
Sophophobia	fear of nights
Verbophobia	fear of learning

WIND/BAROMETER TABLE

Barometer (Reduced to Sea Level)	Wind Direction	Character of Weather Indicated
30.00 to 30.20, and steady	westerly	Fair, with slight changes in temperature, for one to two days.
30.00 to 30.20, and rising rapidly	westerly	Fair, followed within two days by warmer and rain.
30.00 to 30.20, and falling rapidly	south to east	Warmer, and rain within 24 hours.
30.20, or above, and falling rapidly	south to east	Warmer, and rain within 36 hours.
30.20, or above, and falling rapidly	west to north	Cold and clear, quickly followed by warmer and rain.
30.20, or above, and steady	variable	No early change.
30.00, or below, and falling slowly	south to east	Rain within 18 hours that will continue a day or two.
30.00, or below, and falling rapidly	southeast to northeast	Rain, with high wind, followed within two days by clearing, colder.
30.00, or below, and rising	south to west	Clearing and colder within 12 hours.
29.80, or below, and falling rapidly	southeast to northeast	Severe storm of wind and rain imminent. In winter, snow or cold wave within 24 hours.
29.80, or below, and falling rapidly	east to north	Severe northeast gales and heavy rain or snow, followed in winter by cold wave.
29.80, or below, and rising rapidly	going to west	Clearing and colder.

DO YOU HAVE A SORE KNEE?

Free Yourself From Crippling Pain

If you suffer from knee pain, we don't have to tell you how distressing it can be, how disabling it is, and how it can curtail even such simple, basic activities as walking or getting out of a chair.

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The principle of the Levine Knee Strap is that by wearing it you reduce the pressures between the knee cap and the thigh bone, and in that way you relieve the pain and get comfort and — most important — mobility of action. You can walk, you can sit, you can stand, you can run, you can even play ball or dance.

Who needs the Levine Knee Strap?

If your knee hurts when you climb stairs . . .

If you have pain in your knee when sitting in one position for any length of time — and even worse pain when you get up . . .

If you have pain when playing tennis, when jogging, when engaging in any form of physical exercise — and even more pain after the exercise . . .

If you occasionally feel your knee buckling when you're walking or running or dancing . . .

And if you have found the ordinary elastic supports and traditional treatments of little or no help . . .

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You no longer have to resign yourself to pain, you don't have to learn to live with it. Thousands of people who have used the Levine Knee Strap have found blessed relief from this needless suffering — and the chances are you will, too.

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82 YEARS YOUNG!

If I could not replace it, I'd not sell the maul for \$50.00. I've used nothing in its class and I was born in 1900. I'm enclosing \$24.95, for another so I'll have a "loaner" and one to use myself . . . my friends, family and neighbors . . . have all been astonished and delighted with it. You don't know how good it is to use your splitter instead of my Kelly double bit axe. With the axe I used (lost) half my working time freeing the blade when it sunk in but the wood didn't split. Your maul usually splits the block with one blow, if not, it bounces free and I swing again.

Herbert C. Root, Vidor, Tex.
MONSTER BUSTS

SNARLED LOGS!

About 10 days ago I'm out beating futilely on some big old snarl ends of the last of my firewood from two years ago that I didn't want to deal with till I got desperate. Knotty, crooked grain stuff. My old maul took turns bouncing off and sticking in so I had to keep beating the log on the ground to get it out. I beat on one for ten minutes, cursing and sweating and finally got the maul stuck in so bad I couldn't get it out. I left the maul stuck and went in the house and ordered the Monster Maul. Today I saw something orange sitting beside the mailbox and it was the Monster Maul. I took it and busted up the remains of the pile in about five minutes, usually with one lick each, on those snarl logs. Then I hit the log my old maul was stuck in that I couldn't get out and the maul was loose and I pulled it out and threw it on the ground, and left it there. Then I busted up the log in two licks and came in here and wrote this, and ordered a Monster Maul for my dad for Christmas. It's not often anything these days will do what it says it will.

David Haenke, Caulfield, Mo.

MEN FOLK LAUGH!

Will you please send me two Monster Mauls. I ordered one from you last year and listened to my men folk laugh while I split wood. (It's so easy with the Monster Maul that I wanted to do it myself). Our neighbor tried it out and ordered one for himself. He says he doesn't even take wedges or his fiberglass handled maul out into the hills when he goes now. The Monster does it all. Today I loaned my maul to a fellow who is splitting wood for my husband. He took it and came back an hour later telling my husband it's great! Now he wants to keep my maul to finish up the pile and my husband said to get another.

Barbara Orton, Panovitch, Ut.

NO SHOCK METAL HANDLE!

You can add me to the chorus of Monster Maul testimonials . . . it's so much better than any other maul I've ever used, it's amazing. My one concern was shock transmitted down the metal handle-no problem; it doesn't feel any different than a wood handle. Enclosed is an order for a 2 drum stove kit and a lift and saw. Have a happy new year-I know I will.

Jeff Connaway, Council, Id.

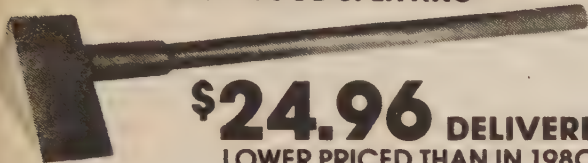
SPLITS OVER 150 CORDS

Over a year ago, I purchased your Sotz monster maul and have never been happier. My husband and I have in just one winter season split over 150 cords of oak and assorted hard woods with your maul. We recently received your latest edition of the Sotz News and I really was impressed with your Lift n Saw. There have been too many occasions where our saw has been jammed or we take our chances and hope we don't hit a rock, but we're never that lucky. Again, thank you for a really fantastic product. I can see why you guarantee your products for so long. They're really worth it.

Dawna Beckmann, Lenox, Mass

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- Forget about lost, stuck, or flying wedges.
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- No wooden handles to replace. No gimmicks. Just simple physics!

We at Sotz have been making the same quiet offer for years: Try a Monster Maul at our risk! Within one year, if you don't think it's the fastest, least tiring method of splitting firewood, let us know, and we will give you your money back, including shipping . . . Plus, it's guaranteed against failure for 10 years.

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- | | |
|---------------|--|
| Weight: | Head-12 lb. (Total weight 15 lb.) |
| Construction: | High-carbon steel head, hardened edge, High strength steel handle. |
| Warranty: | 1-YEAR TRIAL OFFER + 10 years against failure. |
| Price: | \$19.96 Factory pickup.
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WINNING RECIPES IN THE 1982 RECIPE CONTEST "Pickles"

First Prize:

Summer's End Pickle Delight

This mixture can be varied according to the vegetables you have on hand. It can't miss!

In a large bowl, place:

- 2 cups small cucumbers, sliced
- 2 cups chopped onions
- 2 cups quartered green tomatoes
- 2 cups chopped red or green peppers
- 2 cups cauliflower flowerets
- 2 cups broccoli flowerets
- 2 cups cut-up beans

Cover vegetables with a brine made with $\frac{1}{2}$ cup salt to each quart of water, and let sit overnight. The next morning, drain and rinse vegetables, and place them in a large kettle with $1\frac{1}{2}$ quarts cider vinegar. Bring slowly to a boil.

Combine to make a smooth paste:

- 4 tablespoons flour
- 1 cup sugar
- 1 teaspoon turmeric
- 2 tablespoons dry mustard
- enough cider vinegar to moisten

Stir the paste into the vegetables. Simmer for a few minutes, stirring constantly. Fill sterile pint jars to the very top and seal at once.

*Shera Smith,
Newton Centre, Massachusetts*



Second Prize:

My Best Pickles

- 6 cups thinly sliced cucumbers
- 2 cups onions, sliced
- $1\frac{1}{2}$ cups sugar
- $1\frac{1}{2}$ cups vinegar
- $\frac{1}{2}$ teaspoon salt
- $\frac{1}{2}$ teaspoon mustard seeds
- $\frac{1}{2}$ teaspoon celery seeds
- $\frac{1}{2}$ teaspoon turmeric

Pack cucumbers and onions in jars. Heat vinegar, sugar, and spices together and bring to a boil. Pour vinegar over cucumbers and onions and seal at once. Chill before eating.

*Mrs. C. M. Looney,
Crawley, Texas*

Third Prize:

Ozark-Style Bread and Butter Pickles

- 6 cups cucumbers, sliced
- 3 medium onions, sliced
- 1 sweet green pepper, chopped
- $\frac{1}{2}$ cup salt
- 2 cups vinegar
- 2 cups boiling water
- 1 teaspoon celery seeds
- 1 teaspoon mustard seeds
- $\frac{1}{2}$ teaspoon turmeric
- $1\frac{1}{2}$ cups sugar

Mix cucumbers, onions, green pepper, and salt; let stand for 2 hours. Combine vinegar, boiling water, mustard seeds, celery seeds, turmeric, and sugar, and bring to a boil. Combine with cucumbers and cook for 5 minutes. Pack in jars and seal. Makes about $3\frac{1}{2}$ pints. **Note:** The secret to successful pickles is to use cucumbers as soon as they are picked from the garden. If that is not possible, put them in cold water that contains ice cubes, then drain and wipe dry to use.

*Mrs. Mada Perkins,
Hazelwood, Missouri*

1983 RECIPE CONTEST Jams, Jellies, and Marmalades

For 1983, prizes (1st prize \$50, 2nd \$25, 3rd \$15) will be awarded for the best original recipes for jam, jelly, or marmalade. All entries become the property of Yankee Publishing Incorporated, which reserves all rights to the material submitted. Winners will be announced in the 1984 OFA. Deadline is May 1, 1983. Address: Recipe Contest, The Old Farmer's Almanac, Dublin, NH 03444.

WINNING ESSAYS OF THE 1982 ESSAY CONTEST

"Should Thomas Jefferson's Birthday, April 13, be celebrated as a national holiday each year?"

First Prize:

Congressional representatives have strayed far from Jefferson's government "of the people, by the people, and for the people." I think Jefferson's birthday should be made a national holiday and declared "voter awareness day." Each Congressional representative should be required to attend a public meeting in his or her Congressional district to answer constituents. Constituents would have incentive to attend, since on April 13 taxes would be fresh in their minds. Each Congressman would be held accountable and the nation would have an informed voting constituency. Jefferson would smile.

*Robert P. Carey,
Columbus, Ohio*

Second Prize:

Thomas Jefferson's birthday, April 13, should not be commemorated as a national holiday despite his worthiness of such an honor. His memory would be better served by a day of dedication to a moral sense, to self-discipline, to education, to productivity and hard work. Let us remember Thomas Jefferson, one of the most industrious and creative men this country has ever produced, by going about our daily business with a renewed sense of purpose and commitment to the ideals he espoused that made this country great. Remembrance, yes; a day of rest and recreation, no!

*Barbara B. Greene
Santa Barbara, California*

Third Prize:

Thomas Jefferson is eminently worthy to have a national holiday in his honor, but in view of the lack of respect that has developed in celebrating birthdays of such high-standing public servants as George Washington and Abraham Lincoln — their birthdays being combined as "Presidents' Day" and looked upon principally as a day to conduct "Big Sales" — it would be a travesty to expose Thomas Jefferson, the exponent of everything on which our nation is founded, to this disrespect. Do we need a day to remember that "all men are created equal" — with inalienable rights to "life, liberty, and the pursuit of happiness"?

*Mrs. Max Croasmun,
Valier, Pennsylvania*



1983 ESSAY CONTEST

For 1983, prizes (1st prize \$50, 2nd \$25, 3rd \$15) will be awarded for the three best 100-word essays on this topic: "The Worst Day of My Entire Life." All events described must be true, and must have taken place on the same day. All entries become the property of Yankee Publishing Incorporated, which reserves all rights to the material submitted. Winners will be announced in the 1984 OFA. Deadline May 1, 1983. Address: Essay Contest, The Old Farmer's Almanac, Dublin, NH 03444.

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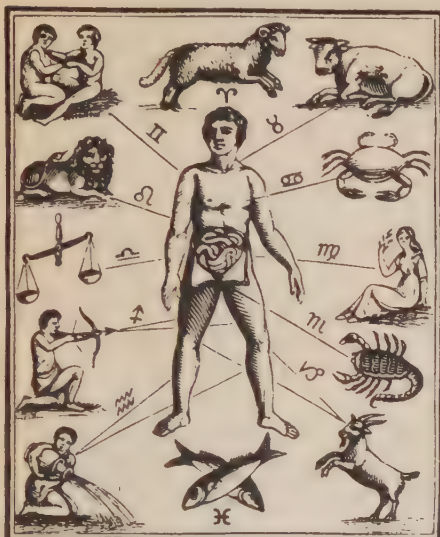
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Secrets of the Zodiac

Famous Debowelled Man of the Signs



- ♈ Aries, head. ARI
Mar. 21-Apr. 19
- ♉ Taurus, neck. TAU
Apr. 20-May 20
- ♊ Gemini, arms. G'M
May 21-June 21
- ♋ Cancer, breast. CNC
June 22-July 22
- ♌ Leo, heart. LEO
July 23-Aug. 22
- ♍ Virgo, belly. VIR
Aug. 23-Sept. 22
- ♎ Libra, reins. LIB
Sept. 23-Oct. 22
- ♏ Scorpio, secrets. SCO
Oct. 23-Nov. 21
- ♐ Sagittarius, thighs. SGR
Nov. 22-Dec. 21
- ♑ Capricorn, knees. CAP
Dec. 22-Jan. 19
- ♒ Aquarius, legs. AQR
Jan. 20-Feb. 18
- ♓ Pisces, feet. PSC
Feb. 19-Mar. 20

The ancients believed that from the knowledge of the location of each planet in the heavens at the exact hour of one's birth one can foresee what kind of a life a child will have, what the child's inclinations will be, and what sort of education will best serve the child. The heavens (called the Zodiac) were divided into 12 equal sections (called Signs) of about 30 days each. There follow on the next two pages brief characterizations of each of these signs. Your sign is determined by the position of the Sun at the time of your birth. If you were born on October 15 then the Sun was in Libra and that is your sign. Each person's horoscope (chart showing the position of the Sun, Moon and all the planets in relation to the Earth at the exact moment of birth) is of course more complex. If you were born on October 15, 1929, the Moon was in the sign Gemini, Mercury in Capricorn, Venus in Sagittarius, and so on. If you were born at noon on October 15 the sign Cancer is rising in your horoscope; if you were born at sundown Aries is rising. Each person thus has a number of signs active in his or her horoscope.

The ancients also associated each of the signs with a part of the body over which they felt the sign held some influence. This belief is illustrated by the famous debowelled man of the signs shown above. Apparently, the first sign of the Zodiac — Aries — was attributed to the head and the rest of the signs fell into place moving down the body, ending with Pisces at the feet.

Many Almanac readers have asked for information as to which activities are best suited to which signs. Below is a listing of activities with letters that appear under each appropriate sign on the following two pages. Moon signs are also used to determine best times for certain jobs — especially gardening — so these signs for each day of November 1982-December 1983 are tabulated on p. 89 along with general rules regarding gardening duties best suited to each sign.

- | | |
|---|--|
| A Cutting grass or brush, weeding. | H Weaning. |
| B Cutting and setting posts or timbers. | I Slaughtering. |
| C Cutting hay, pruning. | J Operations, pulling teeth. |
| D Planting above-ground crops. | K Hairdos, sheep shearing, buying clothes. |
| E Planting root crops, house painting. | L Business, gambling, taking risks. |
| F Harvesting crops or herbs. | M Fishing. |
| G Breeding, setting hens, creating, baking. | N Travel, marriage, romance. |

ARIES

Symbol: ♈ Element: Fire. Planet: Mars.
 Belongs to those born Mar. 21-Apr. 19.
 Traits: Energetic, assertive, impulsive.
 Compatible with: Leo, Sagittarius, Gemini,
 Aquarius.
 Attracted to Virgo.
 Careers: Experimental science, exploration,
 advertising.
 Best for D, L, G, F, I

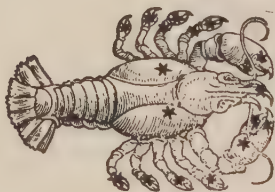


TAURUS

Symbol: ♉ Element: Earth. Planet: Venus.
 Belongs to those born Apr. 20-May 20.
 Traits: Persistent, determined, enduring, loyal.
 Compatible with: Virgo, Capricorn, Cancer,
 Pisces.
 Attracted to Libra.
 Careers: Engineering, farming, building.
 Best for E, K, B, I, F, G

GEMINI

Symbol: ♊ Element: Air. Planet: Mercury.
 Belongs to those born May 21-June 21.
 Traits: Adaptable, lively, talkative, versatile.
 Compatible with: Libra, Aquarius, Leo, Aries.
 Attracted to Scorpio.
 Careers: Crafts, commentary, law, clergy.
 Best for J, G, L, A, I, F



CANCER

Symbol: ♋ Element: Water. Planet: Moon.
 Belongs to those born June 22-July 22.
 Traits: Compassionate, protective, imaginative,
 thrifty.
 Compatible with: Scorpio, Pisces, Virgo, Taurus.
 Attracted to Sagittarius.
 Careers: Business, art, history, antiques.
 Best for D, M, K, G, I, A, C

LEO

Symbol: ♌ Element: Fire. Planet: Sun.
 Belongs to those born July 23-Aug. 22.
 Traits: Generous, creative, well organized.
 Compatible with: Sagittarius, Aries, Libra,
 Gemini.
 Attracted to Capricorn.
 Careers: Medicine, labor, political science.
 Best for K, B, A, F, N



VIRGO

Symbol: ♍ Element: Earth. Planet: Mercury.
 Belongs to those born Aug. 23-Sept. 22.
 Traits: Discriminating, analytical, modest,
 hypercritical.
 Compatible with: Capricorn, Taurus, Scorpio,
 Cancer.
 Attracted to Aquarius.
 Careers: Banking, accounting, teaching, writing.
 Best for J, K, L, A, I, F



LIBRA

Symbol: ♎ Element: Air. Planet: Venus.
Belongs to those born Sept. 23-Oct. 22.
Traits: Charming, diplomatic, idealistic,
indecisive.

Compatible with: Aquarius, Gemini, Sagittarius,
Leo.

Attracted to Pisces.

Careers: Diplomacy, social work, politics.

Best for D, N, K, G, I

SCORPIO

Symbol: ♏ Element: Water. Planet: Pluto.

Belongs to those born Oct. 23-Nov. 21.

Traits: Subtle, intense, passionate, imaginative.

Compatible with: Pisces, Cancer, Capricorn,
Virgo.

Attracted to Aries.

Careers: Psychiatry, psychic research, detection,
journalism.

Best for M, G, I, A



SAGITTARIUS

Symbol: ♐ Element: Fire. Planet: Jupiter.

Belongs to those born Nov. 22-Dec. 21.

Traits: Versatile, frank, philosophical,
optimistic.

Compatible with: Aries, Leo, Aquarius, Libra.

Attracted to Taurus.

Careers: Music, teaching, clergy, horse training.

Best for J, N, K, F, I, H

CAPRICORN

Symbol: ♑ Element: Earth. Planet: Saturn.

Belongs to those born Dec. 22-Jan. 19.

Traits: Ambitious, disciplined, persevering,
pessimistic.

Compatible with: Taurus, Virgo, Pisces, Scorpio.

Attracted to Gemini.

Careers: Architecture, politics, civil service,
administration.

Best for J, G, I, H



AQUARIUS

Symbol: ♒ Element: Air. Planet: Uranus.

Belongs to those born Jan. 20-Feb. 18.

Traits: Independent, unconventional, inventive,
contrary.

Compatible with: Gemini, Libra, Aries,
Sagittarius.

Attracted to Cancer.

Careers: Music, astrology, sociology, inventing.

Best for D, K, B, I, H, A

PISCES

Symbol: ♓ Element: Water. Planet: Neptune.

Belongs to those born Feb. 19-Mar. 20.

Traits: Sensitive, emotional, unworldly,
secretive.

Compatible with: Cancer, Scorpio, Taurus,
Capricorn.

Attracted to Leo.

Careers: Dance, medicine, clergy, music.

Best for D, M, B, G, I, H, C



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ANECDOTES AND PLEASANTRIES

A motley collection of amazing if sometimes useless facts, strange stories, and questionable advice kindly sent to us over the past year by readers of this venerable publication.

HOW MUCH WATER DOES A STEAK DINNER COST?

Of all the water used in the United States, about six percent is for residential purposes, 14 percent for industrial use, and a whopping 80 percent for agricultural purposes. To put agricultural consumption into perspective, here's what it costs, in terms of gallons of water, to produce a typical American meal:

An eight-ounce baked potato "costs" about 12 gallons of water. Put a single pat of butter on it and you've "spent" another 100 gallons. If you're having chicken, add 408 gallons, plus 18 gallons for green beans and six gallons for a salad, not counting dressing.

Dinner rolls at 26 gallons and another 100-gallon pat of butter come up to a grand total of 670 gallons of water for the entire meal.

A meal cheaper in price sometimes costs more in water. For instance, a quarter-pound hamburger, bun, fries, and a Coke will cost 1,427 gallons of water — and that doesn't count the water used to manufacture and distribute the packaging materials involved.

However, if you want to go first class and order steak instead of chicken or hamburger, well, one steak costs about 2,607 gallons of our precious water for every single steak serving.

Facts excerpted from an article by U.S. Representative Tony Coelho of California, published in The Professional Nutritionist.

ORIGINS OF OLD-TIME (PRE-METRIC) MEASURING UNITS

Foot: the length of Charlemagne's foot, modified in 1305 to be 36 barley-corns laid end to end.

Inch: the width across the knuckle

on King Edgar's thumb, or, obviously, three barleycorns.

Yard: the reach from King Henry I's nose to his royal fingertips, a distance also twice as long as a cubit.

Cubit: the length of the arm from elbow to fingertip.

Mile: 1,000 double steps of a Roman legionary. Later, Queen Bess added more feet so the mile would equal eight furlongs.

Furlong: the length of a furrow a team of oxen could plow before resting.

Acre: the amount of land a yoke of oxen could plow in one day.

Fathom: the span of a seaman's outstretched arms; 880 fathoms make a mile.

The metric system, on the other hand, uses the meter, defined precisely as 1,650,763.73 wavelengths of orange-red light emitted by the krypton-86 atom, or originally one-ten-millionth the length of the longitude from the North Pole to the equator. The meter is exactly 39.37 inches — or, that is, some 118 barleycorns.

Courtesy of the National Geographic News Service.

HENRY DAVID THOREAU WAS NOT KNOWN AS A FUNNY MAN, BUT...

When Henry David Thoreau made his memorable walking tour down lower Cape Cod, Massachusetts, in 1849, he marveled at the great quantities of codfish spread out to dry at Provincetown. He visited one fish house and wrote: "The cod in this fish house, just out of the pickle, lay packed several feet deep, and three or four men stood on them in cowhide boots, pitching them onto the barrows with an instru-

ment which had a single iron point. One young man, who chewed tobacco, spat on the fish repeatedly. Well, sir, thought I, when that older man sees you, he will speak to you. But presently I saw the older man do the same thing . . .

"How long does it take to cure these fish?" I asked.

"Two good drying days, sir," was the answer.

"I walked across the street again into the hotel to breakfast and mine host inquired if I would take 'hashed fish or beans.' I took beans, though they never were a favorite dish of mine."

FAMOUS BIBLE BLOOPERS

Ever since the first English versions of the Bible appeared more than 500 years ago, there have been occasional printer's errors in the text. Some of them are obscure enough to be of interest only to scholars: the so-called "He and She Bibles," for example, were the two earliest editions (1611) of the familiar King James Version. In the first, or "He" edition, Ruth 3:15 reads, "and he went into the city"; in the second, or "She" Bible, the same line reads, "and she went into the city."

But in some cases the mistakes were more serious, and those editions have come to be known chiefly for their errors. Some examples are:

The Rebecca's Camels Bible, in which Genesis 24:61 reads, "Rebecca arose, and her camels," instead of "and her damsels."

The Place-Makers' Bible had Christ saying "Blessed are the place-makers," instead of "peace-makers."

The Wife-Hater Bible, which substituted "wife" for "life" in Luke 14:26, so that it reads, "If any man come to me, and hate not his father . . . yea, and his own wife also . . ."

The Ears to Ear Bible, in Matthew 13:43, reads, "Who hath ears to ear, let him hear."

The Unrighteous Bible, printed in 1653, left out a crucial "not" in saying "Know ye not that the unrighteous

shall inherit the Kingdom of God?" (I Corinthians 6:9).

The Wicked Bible cost its printers a stiff fine when it appeared in 1632 with the Seventh Commandment reading, "Thou shalt commit adultery."

So it seems appropriate that in 1702 an edition appeared, later to be known as the *Printers' Bible*, in which David complains that "printers," not "princes," "... have persecuted me without a cause."

A TRICKY METHOD FOR FIXING SHOES THAT PINCH

Roald Dahl, the author and husband of actress Patricia Neal, wrote a letter last year to the venerable *Times* of London that the *Times* printed in full. Dahl wrote that he had recently purchased a pair of gym shoes and found they pinched his toes. He said that fortunately he remembered his school physics course, which taught that "10 volumes of water at zero degrees centigrade expand to 11 volumes at freezing point. So I pushed a plastic bag deep into each shoe and filled it with water. I placed the shoes in the deep freezer compartment of the refrigerator and closed the door. The next morning the water inside the shoes had frozen solid and expanded in all directions by 10 percent." The shoes fit perfectly. Dahl said the system also works with Wellington boots.

Courtesy of The Boston Globe

HOW I KNEW I WAS GROWN-UP (A PERSONAL REMINISCENCE FROM INDIANA)

Pete Freeman was the champion egg eater of our town for years, and his brother Ben acted as Master of Ceremonies at all egg-eating contests. A Saturday afternoon with Mother away at a party, or better still, the rare Sunday when both my parents were away, was the ideal time for a contest. People came from miles around.

Pete's record was 84 at one sitting. He used to drink them raw, six at a

time, from a small bowl. As a favor he used to let us children break them into the bowl for him — until the awful day when one of us inadvertently let one in that was not quite up to standard. After that he had his younger brother Ollie take care of the eggs.

At the beginning of the contest, he and his opponent would sit at opposite ends of a kitchen table, each with his helper behind him. The audience gathered round, but everyone was careful to give Pete enough air. He was fussy about that.

The first 30 or so eggs would go down very quickly. After that, Pete usually stood up and, when his first terrible belch came at about the 45th egg, his backers would look serious and say, "Take it easy, old man . . . No hurry . . . We got all day . . . Robert here is tuckered out already."

Pete would brighten up and usually triumph by drinking 60 eggs or so and, I suppose, would win five or ten dollars. The stakes were outrageously low for such an accomplishment. I knew that I was grown-up when the thought of one of Pete's egg-eating contests made me sick.

Courtesy of Walter Dagen

TWO MUSICAL ANECDOTES FROM GRANDFATHER'S SCRAPBOOK

Have you ever gone to a concert and been annoyed by someone sitting nearby who insisted on singing or humming along with the performers? It seems some folks just can't keep quiet when they hear familiar tunes.

Recently I came across two classic examples of this in a century-old scrapbook that belonged to my grandfather. You'll recognize the names, I'm sure, and the anecdotes reveal warm, human sidelights to these legendary figures.

American operatic soprano Clara Louise Kellogg was born in South Carolina in 1842. When she made her concert debut in New York City in 1861, stage fright so overwhelmed her that her voice faded to a whisper. The or-

chestral accompaniment continued unabated as the young singer stood helplessly, trying to pick up the melody and continue her solo.

Suddenly from "an orchestra seat three rows away came the strain she was struggling with — clear, true, sweet as a lark." The distraught young singer looked out into the audience and saw Adelina Patti "half raised in her seat, beating time with her little gloved hand." The voice and manner of the famed coloratura steadied Miss Kellogg and she was able to resume her singing.

"Having performed a graceful act," Miss Patti relaxed and enjoyed the remainder of the concert.

During the years that followed, Clara Louise Kellogg brought grand opera to countless Americans, helping to ease the trauma of the Civil War that was tearing the nation apart.

The other "sing-along" occurred some years earlier in 1850, and involved the "Swedish Nightingale," Jenny Lind, and American statesman and orator, Daniel Webster.

It seems Webster had enjoyed a late dinner with friends at a Washington hotel, imbibing rather freely the excellent wine that was served. Afterwards the group, which also included Henry Clay, proceeded to the theater where Miss Lind was performing. They arrived just as the curtain went up for her final selection, the popular and patriotic "Hail Columbia."

When Miss Lind began to sing, Webster stood up and "joined in with his magnificent bass, and accompanied her through the song." The unruly audience "yelled, stamped, and shouted" its approval, and Webster and Lind repeated the song five more times!

The article goes on to say that "At the close Webster made a magnificent bow to the diva," which she returned. The bowing then continued back and forth until each bowed "in the most elaborate manner seven times!"

According to the clipping, through-

out the entire episode Mrs. Webster, like any respectable wife, tugged at her husband's coat, "signaling him to desist."

Courtesy of Shirley W. Belleranti

WHY YOU CAN'T WORK FOR YOURSELF UNTIL AFTER LUNCH

According to the Tax Foundation Inc., a nonprofit, nonpartisan research and education group founded in 1937 to monitor tax and fiscal activities at all levels of government, the amount of working time the average American worker took each day in 1982 to earn enough to pay his/her taxes was two hours and 44 minutes. (That's three minutes less than what was required each day in 1981.) So if you started work during 1982 at 9 A.M., it was just 16 minutes to 12 noon before you started earning a penny for yourself!

In 1982 state and local taxes claimed 53 minutes of daily working time while federal taxes took one hour and 51 minutes.

Other major expenditures from an average American worker's eight-hour earnings were detailed as follows:

- Housing and household operation: 90 minutes of working time.
- Food and beverages: 65 minutes.
- Transportation: 42 minutes.
- Medical care: 30 minutes.
- Clothing: 20 minutes.
- Recreation: 20 minutes.
- Other things like personal care, personal business, private education, savings, etc.: 47 minutes.

A DOZEN REASONS WHY WE ALL WANT LOTS OF SNOW THIS WINTER

No or little snow during the winter means:

1. The frost level in the ground sinks lower. This means, for one thing, that it takes longer in the spring for the ground to thaw. Thus the worms take longer to work their way upward and

the microorganic life takes longer to get in gear, all resulting in a late start for gardens.

2. Lower water reserves, possibly resulting in droughts.

3. More summer brush and forest fires.

4. Longer mud seasons.

5. No insulation for seedlings and dehydration of small plants resulting in cold damage. Injury to food crops results in higher consumer prices.

6. Frozen water lines.

7. Frozen wells.

8. Increase in auto injuries — because of no snowbanks to cushion accidents.

9. Bigger frost heaves and more damage to roads resulting in necessary maintenance work.

10. Mold grows on golf courses, which retards and kills the grass roots, so it takes longer in the spring to prepare golf courses for playing.

11. Old trees remain tottering and dead branches are not trimmed.

12. Skiing, snowmobiling, and all manner of winter sports suffer, which has an economic ripple effect throughout the northern United States.

So now . . . don't we all just *love* lots of snow?

HULLING DRIED CORN (Presented Here for the Three, Possibly Four, People in the World Who Would Be Interested.)

1. Put 2 quarts water into a large kettle.

2. Add 2 tablespoons baking soda and stir until dissolved.

3. Add 1 quart dried corn (the kernels from about 4 ears).

4. Soak the corn overnight.

5. The next day add 1 quart water to the corn and baking soda solution. Cook for about 3 hours at a simmer, until the hulls are loosened. Add water as necessary to prevent burning.

6. Drain the corn and rinse it with cold water until it can be handled.

7. Using your hands, rub off the

hulls. This can be done more easily in a pot of water; as the hulls are loosened and the water agitated, the hulls float to the top and can be scooped out.

8. Rinse the pot well. Add the hulled corn and cover it with water.

9. Bring the corn to a boil. Drain off the water. Rinse. (At this point the hulled corn can be preserved for future use by canning, freezing, or drying in the sun or oven.)

10. To cook the corn for immediate use, rinse out the pot. Put the corn back into the pot and add 1 tablespoon salt.

11. Then add more than enough water to cover. Simmer until tender, about 3 hours. Add water as necessary to prevent burning.

Yield: About 4 quarts hulled corn.

So now you have hulled corn. What do you do with it? Well, make samp, naturally. Here's how:

1. Soak 1 cup dried hulled corn overnight in water to cover.

2. Next day, drain the corn and add 3 cups of boiling water and 2 teaspoons salt.

3. Simmer covered for 2 or more hours, to the tenderness desired. Add more water as necessary. The liquid could be reserved for soup.

This may also be prepared in the top of a double boiler.

Yield: About 3 cups cooked corn.

What do you do with samp? Well, if you have your in-laws in for dinner, serve it up and pretend you like it.

TIPS ON THE GENTLE ART OF LISTENING

Basic posture: place left elbow on table and rest cheek in palm of left hand. Not only does this convey the impression of listening intently, but it allows easy use of one finger tip to prop up a heavy eyelid while drawing the lower lid down with another finger. Further, the position of the palm is appropriate in stifling an oncoming yawn.

If a yawn cannot be suppressed: either upset a drink or simply drop a

lighted cigarette behind the sofa. While on hands and knees during the ensuing excitement, you can safely dispense with the yawn. If one's timing is precise, it is occasionally possible in this circumstance to continue creeping on all fours out of the room.

In listening to a funny story: keep in mind that it is important to laugh in the right place, particularly if the narrator is your employer. Sometimes the listening employee is so eager to impress his boss that he jumps the gun and bursts into guffaws at the first pause in the narrative. His hasty efforts to disguise his laugh as a hacking cough are hardly convincing, and the unfortunate bobble makes him so tense that the next time the boss stops for a breath he goes into even louder gales of laughter. In this situation the listener is rarely able to muster anything better than a watery smile when the punch line actually arrives — joined, perhaps, with some lame remark like, "I certainly have got to remember that one."

Courtesy of Garnette Wassen

THE ONLY PROPER AND CORRECT WAY TO MAKE AND SERVE TEA

1. Use a pot of china or pottery ware, never a metal one.

2. Draw the water from the cold water tap and bring to a boil.

3. Pour boiling water into the pot until it is nearly filled and allow it to stand until the pot is hot.

4. Throw away this water and put dry tea into the pot — a rounded teaspoon of loose tea for each cup.

5. Pour vigorously boiling water on the leaves, allow to stand about a minute, and then stir well.

6. Allow to stand 4 to 5 minutes to steep; then pour.

7. Tea should always be poured by a woman . . . and by the same woman until the party is over.

8. When it is time for a second or even a third cup of tea, always ask for "some tea." Never ask for "more tea."

□□

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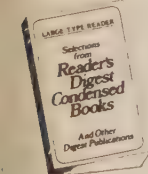
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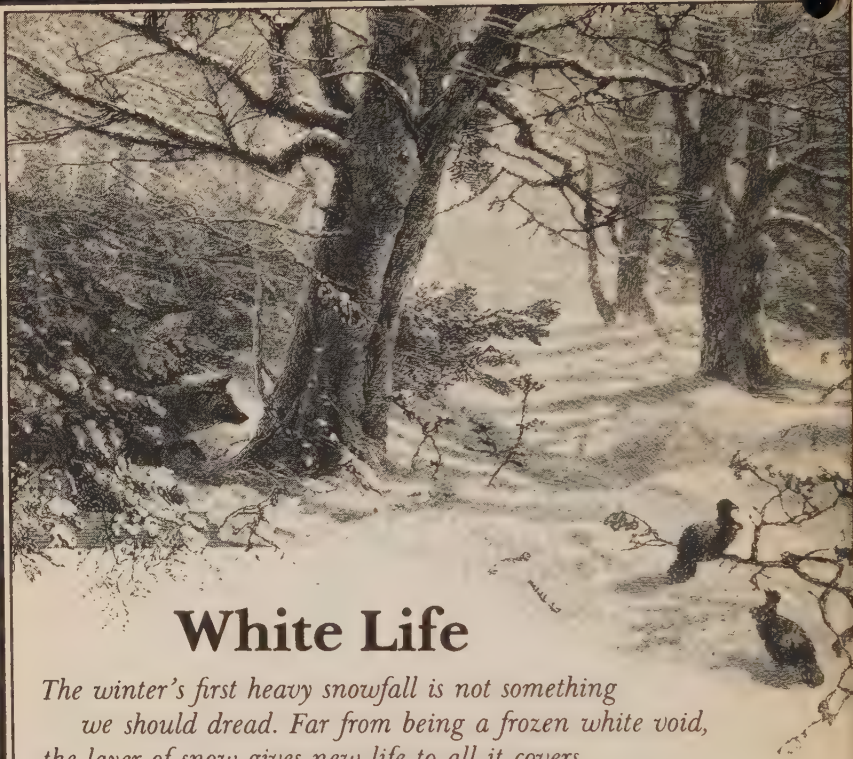
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White Life

The winter's first heavy snowfall is not something we should dread. Far from being a frozen white void, the layer of snow gives new life to all it covers.

by Roger Swain

□ THE VEGETABLE GARDEN DIS-appeared last night. It is out there somewhere, on a line between the apple tree and the telephone pole, but trying to locate it would mean trudging through knee-deep snow. A heavy snowfall like this, the first of the winter, cuts off the supply of kale and brussels sprouts and may confine people indoors for a short time, but it is at the same time a sort of liberation. The outdoor projects that didn't get done now can't be done, and there is no longer any reason to feel guilty about putting the work off. It's too late to bring the stacked bean poles into the barn, to sow winter rye as a cover crop, or to do a final weeding. Knowing that you can't do these things is nearly as satisfying as having done them.

Snowfall not only provides a general

amnesty for procrastinators, but does an excellent job of whitewashing the facts. If you didn't gather up your dead tomato and squash vines, your neighbor will never know. Overnight the wreckage of a bygone growing season disappears and all gardens become equal. Some writers use the words "blanket of snow" to describe new snowfall, but blankets can't even hide wrinkles in a sheet, let alone cabbage stumps. A better term for snowfall, with its accompanying freedom from further gardening responsibility, would be "comforter of snow."

"Think Snow," command the bumper stickers on half the passing cars. With nothing pending in the garden, now is the time to do it. Think Snow, but not of the hard-packed surface on which to slide strips of wood,

plastic, or metal. Think Snow, but not of the metaphorical substance used by poets to signify frigidity, isolation, and death. Think Snow, and this time think of snow's life-giving and life-supporting properties. Think of it as insulation, as a refuge, as a place to live, and as a source of water and nutrients.

With air trapped between each hexagonal crystal, snow provides excellent insulation. Beneath a few feet of it, the ground may be 70 Fahrenheit degrees (40 Celsius degrees) warmer than the air. The daily fluctuations in air temperature do not penetrate snow, and the cycle of freezing and thawing does not exist. When deep snow comes early, there is no need to mulch perennial plants, for the snow will prevent their heaving and protect their dormant crowns.

Eskimos once built snow houses when traveling or wintering on sea ice to hunt seals. Today mountaineers occasionally spend the night in snow caves. During a blizzard, cottontail rabbits will allow themselves to become buried, waiting until the weather improves. Ruffed grouse and ptarmigan will burrow into snowbanks on cold nights.

Snow also insulates the territory of mice and voles, whose networks of narrow runways lead through the matted grass beneath the snow. It may not be excessively cold in these rodent passageways, but it is damp and dark, for two feet of snow filters out all but about 4 percent of the sunlight. The moisture and dampness promote decay. Spurred on by a late application of lawn fertilizer and unfrozen soil, several types of snow mold may spread across the buried grass, resulting in dead patches when the snow melts in the spring. Carbon dioxide, the by-product of decay and animal respiration, tends to accumulate beneath the snow, pooling in hollows. To escape this toxin, voles dig ventilation shafts to the surface, but the air issuing from these round openings is a signal to foxes. With stiff-legged leaps into the snow, the foxes seize their

prey and reduce the damage these rodents cause to the roots and bark of fruit trees.

Unlike grouse, rabbits, or foxes, snow insects are too small to leave tracks in the snow. Yet on a warm spring day when the snow has melted away from tree trunks and rocks, thousands of snow fleas may appear on the snow surface. These tiny black collembolans possess a forked appendage that can be folded beneath the abdomen and triggered suddenly, causing the quarter-inch insects to spring four inches into the air.

Snow fleas are harmless, even to snowmen. They ordinarily live in leaf litter and feed on microorganisms and other products of decay. Why they should appear on the surface of the snow, sometimes in unbelievable numbers, remains completely unknown.

Equally mysterious is the appearance of several species of *Boreus*, flightless scorpion flies about twice the size of snow fleas. These may appear at any time during the winter on warm days, jumping about on the surface of the snow. A third, less common insect is the snow fly, or thick-legged gnat. This species of *Chionea* is one of the crane flies but looks much more like a spider than a fly. Walking awkwardly about on the snow, these wingless insects are apparently searching for mates.

The most impressive invertebrate found in the snow is the snow worm. On snowfields and glaciers in California, Oregon, Washington, and Alaska, these inch-long black worms have been seen massed over more than 40 acres of snow. Sometimes called glacier worms, these segmented worms of the genus *Mesenchytraeus* are capable of boring through hard-packed snow at will and appear on the surface at certain times of day. Some of them are consumed by birds; some find their way into drinks served in Yukon bars.

Where snowfields melt in summer, the snow worms spend part of their life in the soil, but on permanent snowfields and glaciers they spend their en-



ture life surrounded by snow. To survive, these unusual annelids have come to rely on an equally unusual food — snow algae. Algae, some of which have evolved to live in the warmest hot springs, have also evolved to live on the coldest glaciers.

Aristotle was the first to mention colored snow, but John Ross was among the first to collect any — from an eight-mile stretch of red snow cliff overlooking Baffin Bay in 1818. It was not until the late nineteenth century that biologists were able to explain the phenomenon: dense populations of colored algae on the snow surface. Although individual algae are only one micron to one hundred microns in diameter, high concentrations, or “blooms,” containing up to 500,000 algae per milliliter of snow, can occur, and the result is snow tinted red, orange, or green, depending on the species of algae involved. Green snow occurs where there is shade, red snow in full sun, and orange snow under intermediate conditions. To date, more than one hundred species of snow algae have been identified in the world. While some of these are not restricted to snow, others are true cryophiles (cold lovers) and grow only at temperatures close to freezing.

Even snow algae cannot grow when the snow is frozen; there must be a supply of melted water. Thus, in the mountains of North America where snow algae are most conspicuous, the algae do not usually appear until May or June. They may first be apparent in the tracks of alpine hikers, red footprints

caused by compacting the snow and increasing the density of algae.

It is intriguing to wonder how the algae colonize a new snowbank in early spring. While it is possible that in some cases spores are carried by wind from snow-free soil or that birds carry algae in their guts or on their bodies, in the case of *Chlamydomonas nivalis*, the algae move to the surface of the new snow. Experiments at Oregon State University have shown that these algae lie dormant beneath snow during the winter and in the spring produce flagellated cells that swim up through the snow to the surface where they begin to multiply.

The snow worms feed on the snow algae, and the algae in turn feed on snow — at least partially. Sunlight, water, and carbon dioxide are necessary for algal growth, but essential nutrients come from the snow. (Even without algae and worms and ptarmigan, snow is not nearly as sterile as poets would have you believe.) Snowbanks contain nitrates, phosphates, and a host of other organic and inorganic compounds. Some of these come from contact with soil, others from debris blown onto the soil surface. But even new-blown snow isn't pure water; it contains the atmospheric nuclei around which the snowflakes first crystallized.

On permanent snowfields, the nutrients in snow cycle through a food chain that includes algae and snow worms, but on the vegetable garden the warm winds of spring will return these nutrients to the soil. Snow is the poor man's fertilizer. The same white drifts that protected dormant plants during the winter will yield essential moisture and nutrients for next summer's crops. The heavy flakes drifting down on a gray December afternoon may signal the end of one growing season, but just as certainly they bring promise of another. □□

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It's packed with over 400 vegetables and 650 flowers—including new varieties and Burpee exclusives! Plus fruits, shrubs, garden aids, and more! Send for yours *now!*



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QUINAULT EVERBEARING STRAWBERRIES GREAT NEW VARIETY

PICK BERRIES UP TO 2" IN
DIAMETER FROM JUNE . . TILL FROST

10 for \$1.95

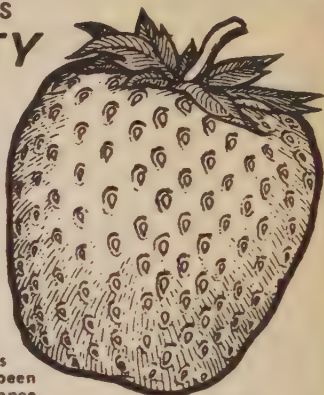
25 for \$ 3.95

50 for \$6.95

100 for \$11.95

PLANT THIS YEAR — HARVEST THIS YEAR

Here's a great-tasting, heavy-bearing new everbearing Strawberry that grows so big we hesitate to tell you . . we're afraid you won't believe us. But they have been found as big as tea cups! This amazing berry was developed by Washington State University. It is well on its way to being the greatest performer ever. Quinault has been tested in 13 states and Canada with excellent performance record for size, taste and plant growth. IT WAS FOUND TO BE THE MOST DISEASE—FREE EVERBEARING WE HAVE EVER TESTED! Because it is so new the Quinault is still being tested. But it appears to have all the properties to make it a very popular . . . if not the MOST POPULAR VARIETY OF EVERBEARING STRAWBERRIES. AMAZE YOUR FRIENDS - pick quarts of big, delicious Strawberries every few weeks all summer long! Place your order today and get them started now. Order at least 50 plants to try them out . . . or more if you can handle them. Plant Quinault Everbearings this Spring and begin harvesting big, red, ripe Strawberries . . . often in just 6 weeks . . . and all summer long.



EASY-TO-GROW — BIG—TENDER
DELICIOUS

ASPARAGUS

10 plants only \$1.00

20 for \$1.75

30 for \$2.50

Big, tender, delicious — and perhaps the easiest of all summer vegetables! Once established the original planting usually produces for 20 years! Martha Washington variety produces abundant, giant-size with tender tips.



FROM YOUR GARDEN, VERY . . .

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TENDER — MEATY
DELICIOUS
OLD—FASHIONED

VICTORIA RHUBARB

5 Roots only \$1.00

10 for \$1.75 15 for \$2.50

How about some old-fashioned Rhubarb pie! It is easy to start and this Victoria Rhubarb grows a new crop every year without replanting! Gives beautiful flowers, too. Makes a nice perennial border. Large 5/8" to 1" nursery stock. Sorry, can't be shipped to California.



FULL ONE-YEAR GUARANTEE

All plants are guaranteed to be high quality, and to reach you in good healthy condition ready for planting, or your purchase price will be refunded. In order to receive a refund, RETURN THE SHIPPING LABEL ONLY. You may keep the plants. (One year limit.)

HOUSE OF WESLEY, NURSERY DIVISION
DEPT. 9972-65
BLOOMINGTON, ILLINOIS 61701

HOW MANY	CAT. NO.	DESCRIPTION	COST
	132	Asparagus	
	567	Quinault Everbearing Strawberries	
	735	Rhubarb	

Illinois Residents add 5% Sales Tax
Postage and handling

NAME _____ TOTAL \$.65

ADDRESS _____

CITY _____ STATE _____ ZIP _____

JANUARY							FEBRUARY							MARCH							APRIL								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
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10	11	12	13	14	15	16	10	11	12	13	14	15	16	10	11	12	13	14	15	16	10	11	12	13	14	15	16		
17	18	19	20	21	22	23	17	18	19	20	21	22	23	17	18	19	20	21	22	23	17	18	19	20	21	22	23		
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19	20	21	22	23	24	25	10	11	12	13	14	15	15	16	17	18	19	20	12	13	14	15	16	17	18	19	20	21	22
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JANUARY							FEBRUARY							MARCH							APRIL						
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SEPTEMBER							OCTOBER							NOVEMBER							DECEMBER						
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23	24	25	26	27	28	29	28	29	30	31	—	—	—	25	26	27	28	29	30	—	30	31	—	—	—	—	—

NOW — Just when you need a REAL Money Miracle

RUB THE BUDDHA FOR MONEY!

Do you need money desperately? Are you up to your neck in overdue bills and worrisome debt? Are you struggling along just trying to make ends meet — with no light in sight?

Then, here's the good news you've been hoping and praying for all your life!

Now, for the very first time, you can possess the long-renowned BUDDHA . . . acclaimed by many for its magic powers of attracting GREAT wealth and unbelievable riches to anyone who gently rubs his belly!

But before I go on, let me ask you this: How much money do you REALLY want? \$100.00, \$1,000.00, even \$10,000.00 or more?

Don't be shy. Just name the amount, ANY amount. Then join me in a unique Research Experiment to find out if the BUDDHA legend is really true.

And listen to this: To make this offer so unbelievably attractive that you'll clip and mail the coupon *Right Now*, I'm going to gamble my own money on you, a perfect stranger.

That's right! You MUST agree that the legend is absolutely true — that The BUDDHA actually brings you money by rubbing his belly — or I'll pay you for your time and trouble **GUARANTEED!**

But first, let me assure you of this. I know exactly what I'm doing. I wouldn't dare make such an offer if I thought for one minute that I would lose! So for your own sake, simply mail the coupon to receive your very own BUDDHA and the Research Experiment Forms.

Do you want lots of money NOW? Then starting immediately, and continuing for as long as you rub The BUDDHA, you'll have this sensational opportunity to possibly rub away your financial problems forever. Imagine the excitement and thrill of turning your cash situation **RIGHT AROUND** merely by rubbing The BUDDHA's belly as part of the Experiment.

\$\$\$ When you want to pay off debts, simply rub The BUDDHA.

\$\$\$ When you want to buy a house, simply rub The BUDDHA.

\$\$\$ When you want to go on a long-overdue vacation, simply rub The BUDDHA.

\$\$\$ When you want to buy a new car, TV, boat, or whatever you wish, simply rub The BUDDHA!

LET ME KNOW EVERY TIME THE BUDDHA BRINGS MONEY!

Whenever The BUDDHA miraculously puts fist-loads of cash right in your pocket . . . whenever you enjoy the glorious thrill of paying off a nagging bill collector . . . whenever you joyfully catch up on your monthly payments . . . just report the actual MONEY MIRACLE.

Even if you are skeptical, you have absolutely nothing in the world to lose. Not even a penny of your hard-earned money. Because from the very moment you receive The BUDDHA, you must receive a fantastic moneyblessing, or I'll pay you for your time and trouble. **GUARANTEED!**

And here is the best part of all! It doesn't matter who you are, where you live, how much you need! You MUST agree that the BUDDHA legend is true **RIGHT AWAY**, or I'll return your money **PLUS** pay you for participating in this unusual Research Experiment.

SEND FOR YOUR BUDDHA AT ONCE WITHOUT RISK!

Right now, this very second, mail the coupon for your very own BUDDHA. For total 100% confidentiality, your BUDDHA will be rushed back to you in a private unmarked package — in YOUR name only. No one will be allowed to use it, except you. Then merely take The BUDDHA into your right hand and gently rub his magic belly. It's that simple!

DOUBLE MONEY-BACK! 100% GUARANTEED!

I can't imagine anyone passing up this unique chance to join the Research Experiment and use the legendary BUDDHA every



(Illustration image) for detail

single day. So the only thing holding you back is taking a risk. I'm going to eliminate that completely!

To prove to you that I mean every word I've said — I'll give you this fantastic **DOUBLE MONEY-BACK GUARANTEE**: The BUDDHA must work a money miracle for you within 14 days, or I'll return ALL your money PLUS ANOTHER \$7.00 for your time and trouble. That's right! You'll receive **DOUBLE YOUR MONEY BACK** with no strings attached!

If you've never thought of clipping a coupon before, do it NOW. It may be the answer to ALL your money problems.

ORDER RIGHT NOW FOR IMMEDIATE DELIVERY!

1.) Print your name and address on the coupon below.

2.) Attach your cash, check or money order payable to The BUDDHA for just \$7.00 complete. (Price includes postage and handling!)

3.) Mail to: The BUDDHA, 49 West 37th St., New York, N.Y. 10018

MAIL COUPON WITH \$7.00

The BUDDHA
49 West 37th St., Dept. A-205
New York, N.Y. 10018

I WANT TO
RUB THE BUDDHA FOR MONEY!

Here's just \$7.00. Rush me The BUDDHA and the Research Experiment Forms in a private unmarked package. Money-back in 14 days if not absolutely thrilled with results PLUS ANOTHER \$7.00. That's **DOUBLE** my money-back **GUARANTEED!**

Name _____

Address _____

City _____

State _____

ZIP _____

☐ Rush me TWO orders! Here is \$13 for both. Same guarantee! ©MCHLXXX The BUDDHA

FREE BONUS GIFT!

**THE \$1,000.00 SECRET
YOURS FOR ACTING NOW!**

Mail the coupon at once and I'll include this EXTRA exclusive gift with your order.

This amazing secret could change your life instantly and bring you new thrilling success and happiness.

Your personal copy to keep permanently — FREE. Clip and mail coupon today!

If you have another use for Arm & Hammer® Baking Soda, we'd like to know about it.

For years we've been telling people about all the great things you can do with Arm & Hammer Baking Soda. Well now we're looking for new uses. If you have one, fill out the coupon below and send it in. If it's a great new way to use Arm & Hammer Baking Soda we may print your use on our box. But first check our uses to make sure your's isn't already famous.

The most popular use is **DEODORIZING** your **REFRIGERATOR** and **FREEZER**. **BAKING** comes next. Try sprinkling some in your **BATH** water. It's a pure and natural skin conditioner. It soothes burns, insect bites, skin rashes and leaves you feeling soft and clean. Pour a box down the **DRAIN**. It'll sweeten it and make your **SEPTIC TANK** work better. A half teaspoon in a glass of water makes a great **ANTACID** too! Be sure to follow label directions. And you can use Arm & Hammer Baking Soda to **CLEAN** just about everything in the house. It's great for cleaning greasy refrigerators, freezers, stoves, cutting boards, dishwashers, thermos bottles, food containers, coffee pots, and just about everything else in the kitchen. Don't stop in the kitchen. Arm & Hammer also cleans bathroom surfaces without abrasion. Try brushing your **TEETH** with it. Or use it as a **MOUTHWASH**. You can also use it to clean and deodorize **COMBS** and **BRUSHES**. It's great for cleaning and deodorizing **CARPETS** too! It will keep your **CAT LITTER** smelling fresh for days and days. Put some in your **CAR ASHTRAY** to keep it smelling fresh. It also puts out **FIRES** and helps keep your **SWIMMING POOL** water crystal clear. Add it to the **LAUNDRY**, it makes your clothes smell sweet and fresh.

That's just some of the things you can do with Arm & Hammer Baking Soda. We hope you can come up with some new uses. Any submitted become our property and compensation shall be at our discretion. If you don't have any new uses, fill out and send in the coupon anyway, enclosing a stamped self-addressed envelope and we'll send you a free booklet which gives you some more baking soda ideas. And remember Arm & Hammer Baking Soda is quality controlled from start to finish. It's the one your whole family can trust for just about any job in the house.

NAME _____

ADDRESS _____ CITY _____

STATE _____ ZIP _____

YOUR USE: _____

Send your uses to:

My Favorite Use

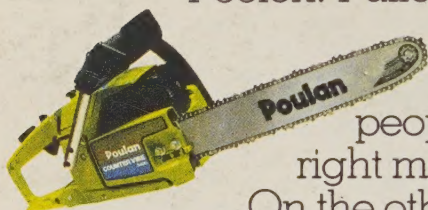
Arm & Hammer Division of
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WHY MORE PEOPLE ARE ASKING FOR A CHAIN SAW THEY CAN'T EVEN PRONOUNCE.

Poolen. Pullen. Polann.



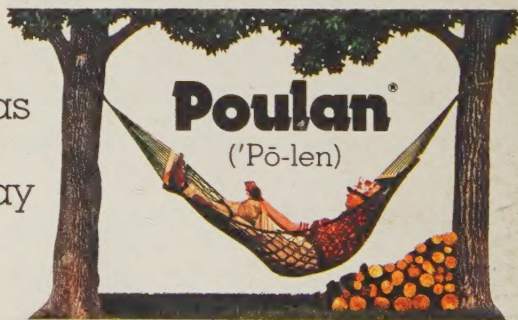
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people to say the name right may be asking a lot.

On the other hand, people ask an awful lot of our saws. Extra cutting power. Quiet operation. Quick starting. Beautiful styling. Durability. Affordability.

And we deliver all that plus a lot of other standard features, no matter which Poulan saw they buy. From the new Poulan 1800 right on up to our pro models.

At Poulan, we figure the more we put into our saws, the less people have to put into cutting. Maybe that's why more and more people keep asking for our saws. And as long as they do that, they can say the name any way they like.



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